DEVELOPMENT & BUILDING SERVICE CENTER
ONE STOP
600 SECOND ST. N.W./2ND FLOOR
ATTENTION: _____
505-924-3900

Records Withdrawal Form

Project No. M10/D12 Date: 5/7/99

Project Title: Revised Master Drainage Report for Desert Flower

a. File b. Mylars c. Redlines/Comments
d. Other Drainage Report

Mark Holstad

Requested By: URS GWC **Phone No.:** 345-3999
Company

Comments: _____

Anticipated Return Date: 5/14/99

Receipt Acknowledged

I here by accept full responsibility for the security of the above noted records/plans until return receipt acknowledgement is completed. Records/plans will be returned to the Development & Building Services Center on or before the indicated anticipated return date.

Delivery Picked Up By:

Name: Mark Holstad Organization: URS GWC
Print

Signed: [signature] Date: 5/7/99
Phone No. 345-3999

Office Use Only

Return Acknowledged

Received by: Eileen Rivera **Date:** 5-10-99
Print

ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

Albuquerque, NM

CITY OF
Albuquerque

June 11, 1998

Fred C. Arfman, P.E.
Isaacson & Arfman
128 Monroe Street NE
Albuquerque, New Mexico 87108

RE: Revised Master Drainage Report for Desert Flower Subdivision, Units One - Five, (M10/D12) Submitted for Master Plan Approval, Engineer's Stamp Dated 5/18/98.

Dear Mr. Arfman:

Based on the information provided in the submittal of May 21, 1998, the above referenced Master Drainage Plan is acceptable to City Hydrology.

As you are aware, drainage reports for each Unit must be submitted to and approved by this office prior to Preliminary Plat approval of each Unit. These drainage reports must be in compliance with this approved Master plan.

If you have any questions regarding these comments, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Bo Johnson, Curb Inc.
File

Unit 2 = M10/D12B
Unit 3 = M10/D12C

Renumbered M10/D12

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Desert Flower Master Drainage Report (Revised)

ZONE ATLAS/DRNG. FILE#: M-10 D005

DRB # 96 532

EPC #

WORK ORDER #

LEGAL DESCRIPTION: Tract A, B1, & B2 Desert Flower SD, Mesa Enterprises Limited (Warranty Deed)

CITY ADDRESS:

ENGINEERING FIRM: Isaacson & Arfman, P.A. CONTACT: Melissa Combs
ADDRESS: 128 Monroe Street NE PHONE: 268-8828
CITY, STATE: Albuquerque, NM ZIP CODE: 87108

OWNER: Curb Inc CONTACT: Bo Johnson
ADDRESS: 6301 Indian School Rd, Suite 680 PHONE: 881-9190
CITY, STATE: Albuquerque NM ZIP CODE: 87110

ARCHITECT: N/A CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: Aldrich Land Surveying CONTACT: Tim Aldrich
ADDRESS: PO Box 30701 PHONE: 884-1990
CITY, STATE: Albuquerque NM ZIP CODE: 87190

CONTRACTOR: N/A CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

TYPE OF SUBMITTAL:

✓ DRAINAGE REPORT
___ DRAINAGE PLAN
___ CONCEPTUAL GRADING & DRAINAGE PLAN
___ GRADING PLAN
___ EROSION CONTROL PLAN
___ ENGINEER'S CERTIFICATION
✓ OTHER

PRE-DESIGN MEETING:

___ YES
___ NO
___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL
___ PRELIMINARY PLAT APPROVAL
___ S.DEV. PLAN FOR SUB'D. APPROVAL
___ S.DEV. PLAN FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ FOUNDATION PERMIT APPROVAL
___ BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ S.A.D. DRAINAGE REPORT
___ DRAINAGE REQUIREMENTS
✓ OTHER (SPECIFY) Master Drainage Report

RECEIVED MAY 21 1998 HYDROLOGY SECTION

6/4/98 - hold for add'l info

DATE SUBMITTED: 5/21/98

BY: Melissa Combs
FOR ISAACSON & ARFMAN, P.A.

REVISED MASTER DRAINAGE REPORT

FOR

DESERT FLOWER SUBDIVISION
UNITS ONE THROUGH FIVE

A 480 LOT (FIVE PHASE) SINGLE FAMILY RESIDENTIAL SUBDIVISION

ALBUQUERQUE NEW MEXICO
MAY 1998

RECEIVED
MAY 21 1998
HYDROLOGY SECTION

Prepared by:

ISAACSON & ARFMAN, P.A.
128 Monroe Street, NE
Albuquerque, NM 87108
(505) 268-8828

FRED C. ARFMAN
STATE OF NEW MEXICO
7382
REGISTERED PROFESSIONAL ENGINEER

05-18-98

Fred C. Arfman, P.E. **Date**

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- Table 3 - Inlets Capacity at Key Locations
- Table 4 - Storm Drain Capacity
- Pond Sizing Calculations

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- Appendix B: Unser Blvd. - 10-Year Dry Lane Study
- Appendix C: Discharge to the Amole Del Norte Diversion Channel (Ref. Arenal/Unser Drainage Management Plan)

Pockets

- Master Drainage Plan of May 1998
- Typical Lot Detail

INTRODUCTION

This report shall serve as a revision to the Master Drainage Report for Desert Flower Subdivision, Units One-Four (M10/D5) approved on July 25, 1997 and filed at the city. This revision is necessary to account for the acquisition of the 22 acre parcel of land just to the west of the Amole del Norte Diversion Channel by the owners of this subdivision. The addition of this piece of property will allow for more of the flows to be carried by the streets and required less storm drain to be installed site wide.

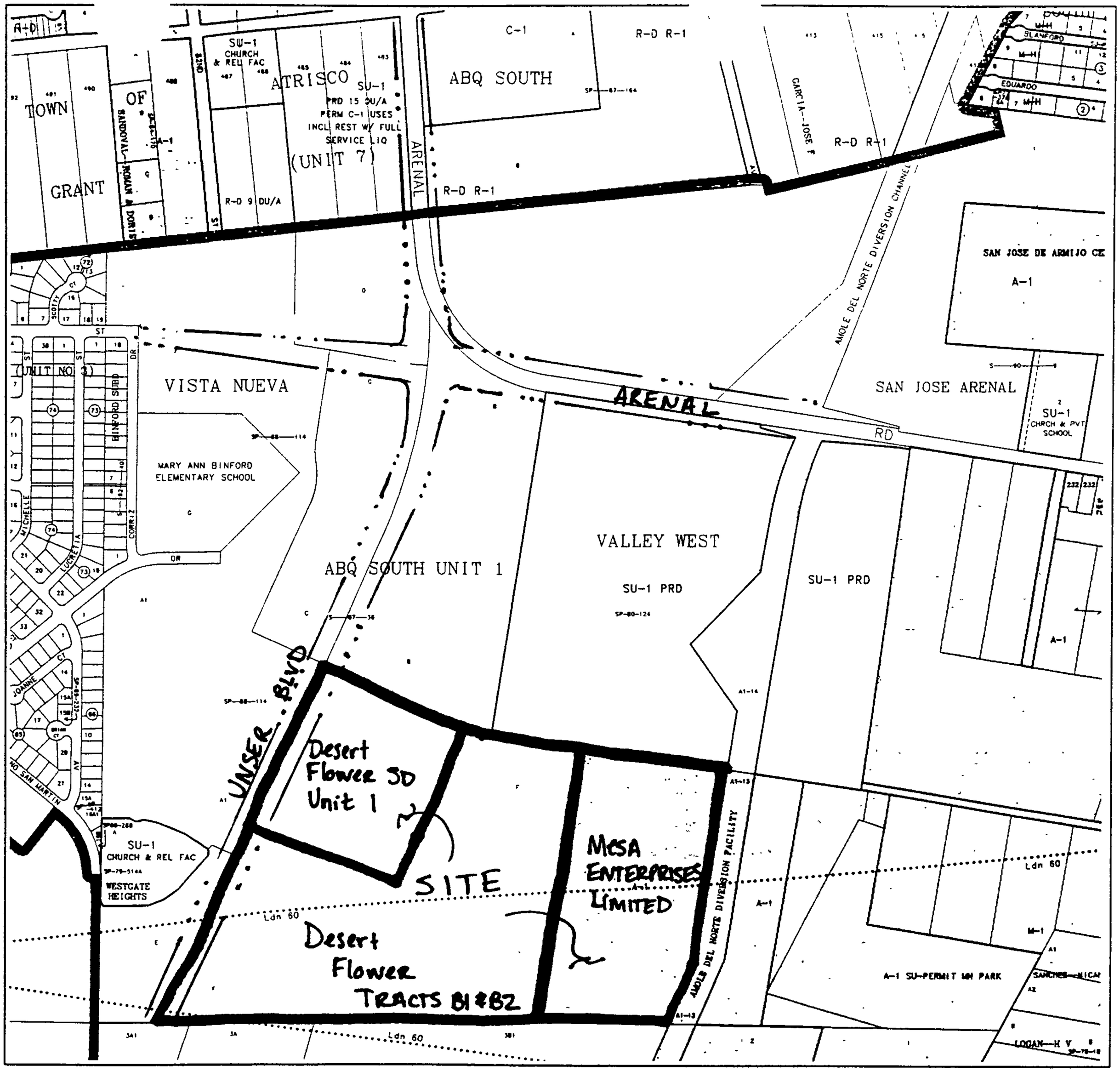
The new parcel of land shall be developed as a minimum of one additional unit in the Desert Flower Subdivision. The five phases, Units One-Five, will consist of 84, 76, 115, 63, and 142 single family lots, respectfully.

This study shall analyze the area wide drainage characteristics as they impact the site and offer solutions and recommendations to solve the hydrological and hydraulic conditions projected to occur in the event of the 100-year storm.

I. PROJECT INFORMATION

LEGAL DESCRIPTION: Desert Flower Subdivision, Tract A (June 5, 1997, Book 97C, Page 175)
Desert Flower Subdivision, Tracts B1 & B2 (March 11, 1998, Book 98C, Page 66)
Mesa Enterprises Limited (Warranty Deed, April 23, 1980, Book D118A, Page 145)

ENGINEER: Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
Attn: Fred C. Arfman, P.E.
(505) 268-8828



SCALE IN FEET

250 0 500 1000

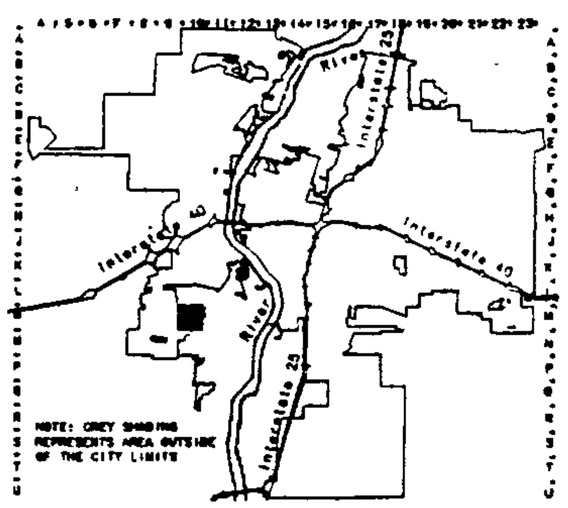
PHOTOCOPY--NOT TO SCALE

North

AGIS

© Planning Department

Map Amended through June 15, 1994



LEGAL DESCRIPTION

T10N

R2E

SEC 34

UNIFORM PROPERTY CODE

1-010-055

M-10-Z

SURVEYOR: Aldrich Land Surveying, Inc.
Attn: Tim Aldrich, NMPLS No. 7719
(505) 884-1990

BENCHMARK: ACS Monument "1-M10" located at the southeast quadrant of Sage Road and Unser Blvd. SW.
Elevation: 5079.88

ZONING: RLT

NUMBER OF PROPOSED LOTS:

Unit One:	84	85
Unit Two:	76	77
Unit Three:	115	
Unit Four:	63	70
Unit Five:	141	142
	479	489 ?

revised per 6/8/98 letter

TOTAL AREA: 82.35 Ac.
3,587,166 Sq. Ft.

II. SITE CHARACTERISTICS

FLOOD HAZARD: No part of this development is affected nor contributes to a flood hazard area as determined by Map No. 35001C0336D and 35001C0337D of the September 20, 1996 Edition of the F.E.M.A. Maps.

EXISTING CONDITIONS: This site is currently undeveloped and mostly undisturbed with native ground cover, typical of the City's west side (Land Treatment B). The site has a slope downward toward the east at slopes ranging from 1 to 2 percent. It abuts future Desert Springs Subdivision to the north, Unser Blvd. to the west, the Amole del Norte Diversion Channel to the east, and Vista del Sol Mobile Home Park to the south. Storm water generated from the site flows east

into the side of the Amole del Norte Diversion Channel. Offsite storm waters generated from Units Two and Three of Sunrise Estates currently are released to Unser Blvd. and are then conveyed by a combination of street flow and storm drain to an offsite detention pond. Flows are slowly released through a storm drain system along Arenal Road which deposits the discharge into the Amole del Norte Diversion Channel. Runoff south of the proposed development flows southeast into the Amole del Norte Diversion Channel and does not affect the site.

PROPOSED CONDITIONS:

Unit One: This unit is currently under construction and is being developed per the approved Master Drainage Report and the Drainage Report for Unit One. Storm water flows from April Flower Road, Purple Cone Road, and Purple Fringe Road will enter a temporary retention pond capable of accepting the 100-year 10-day volume. Storm drain is not required with this Unit.

Unser Blvd.: Being adjacent and to the west of this phase, Unser Blvd. is included as part of the development and has been analyzed for storm water flow carrying capacity for both the 10-year and 100-year events (see Appendix B).

An extension of the existing storm drain on Unser Blvd. from Sunrise Estates Unit Two to Tract E (Albuquerque South Unit 1) is being constructed with this phase.

Unit Two: The second phase will be Tract B1 (located east of Unit One), and will consist of 76 lots. The temporary retention pond used to capture Unit One runoff will be removed. Flows from Unit One will be allowed to enter Unit Two with the continuation of Purple Cone Road and Purple Fringe Road. The flows on these streets, comprised of the runoffs from Unit One and most of the runoffs from Unit Two, will continue east to the Amole del Norte Diversion Channel via earthen channels constructed along the future street alignments. The runoff generated along April Flower Place will combine with the runoff in Purple Cone Road prior to the rundown entrance. Saltbrush Road runoff will also be conveyed to the east via an earthen channel. This channel will be offset from the future street alignment to keep the existing sanitary sewer line from being compromised. All three rundowns will deposit the runoff into a desiltation pond prior to discharging into the Amole del Norte Diversion Channel. Storm drain construction will not be required with this phase of the project.

Unit Three: The third phase of Desert Flower may either be the west half of Tract B2 (south of Unit One and adjacent to Unser Blvd.) or the Mesa Enterprises land located just west of the Amole del Norte Diversion Channel. For the purpose of this report the west half of Tract B2 will be Unit Three.

The development of the 115 lots of this phase will not require storm drain construction. Runoff at the upper end on Native Flower Place will flow onto Spring Flower Place and combine with the runoff on Spring Flower Road. Runoff from Purple Rock Place and Desertwood Drive will also be added to the flows in Spring Flower Road. The total runoff along this road will then enter a temporary retention pond in the future Unit Four.

The southern portion of Unser Blvd. adjacent to this phase, has a southerly surface drainage pattern. Street flows from this area shall enter into a temporary retention pond situated at the southerly terminus of Unser Blvd.

Unit Four: The fourth phase will be located in the east half of Tract B2. It will have 63 lots and will not require the construction of a storm drain. Temporary retention ponds used to capture runoffs from Unit Three will be removed and the runoff along Spring Flower Road will be allowed to enter Unit Four. A portion of the flows from Desert Springs Drive, Purple Canyon Drive, and Cosmos Drive will be added to the flows along Spring Flower Road, and the remaining discharge from these streets will be collected by Saltbrush Road. Temporary retention ponds situated to the east of Unit Four will collect the runoff from this phase.

Unit Five: The final phase of Desert Flower will consist of 142 lots. A storm drain system and an overland channel will deposit the runoff from all of the phases into the Amole del Norte Diversion Channel. The temporary ponds and rundowns from Units Two and Four will be removed, and the flows from the previous units will be allowed to enter Unit Five with the continuation of Purple Fringe, Saltbrush, Purple Cone, and Spring Flower Roads.

Runoff along Purple Cone Road will be carried by street flow to the most easterly street which runs north and south. There the flows will combine with the discharge from April Flower Place and be collected by modified sump inlets. There are two storm drain options for conveying the runoff to the Amole del Norte Diversion Channel from this point. The first option would be to run the storm drain south from this point, until it reaches Saltbrush Road. There it will turn to the east and connect into the Amole del Norte Diversion Channel. The second option would be to run the storm drain due east to the Amole del Norte Diversion Channel through a pedestrian access which would also function as an emergency overflow. Runoff will also be collected by a battery of inlets along both Purple Fringe Road and the most easterly north/south road to be conveyed to the channel via storm drain. Any remaining street flow will combine with the flows along Saltbrush Road and will be deposited in the Amole del Norte Diversion Channel via an overland channel connection located at the eastern terminus of Spring Flower Road.

The discharge along Spring Flower Road will also be conveyed via the overland channel to the Amole del Norte Diversion Channel. The storm drain lines and channel will be included on the required infrastructure listing for Unit Five.

CONCLUSIONS & RECOMMENDATIONS

Desert Flower Units One through Five are proposed to be developed consecutively. Onsite and offsite runoffs have been addressed as to how the subdivision will have a cohesive drainage solution. The Summary Tables provide a more in depth study of the street capacities, drainage basins, and inlet capacities. Please refer to the Appendices for further supplemental information.

The recommendations for Units One through Five construction are presented below:

- Retention ponds are required at the downstream end of Units One, Three, and Four where the runoffs will be discharged onto future unit (sized for 100-year 10-day event).

- Rundowns and a desiltation pond will be required downstream of Unit Two until Unit Five is constructed and the flows can be carried by the streets to the Amole del Norte Diversion Channel.

- Retention ponds will be removed and replaced with either a storm drain system or appropriate rundown when the abutting unit is in place.

- Berms or swale points shall be graded around the developing unit so that offsite runoff will not affect this unit.

- Lots running parallel to Unser Blvd. shall be graded to be close in elevation to Unser Blvd. future grades.

- All storm drain from Unit Five to the Amole del Norte Diversion Channel shall be included as part of the Unit Five required infrastructure.

- Developer shall construct the storm drain outfalls to the Amole del Norte Diversion Channel as determined necessary in the Unit Five Drainage Report.

- A permanent overland outfall to the Amole del Norte Diversion Channel will be required with Unit Five construction.

- Adjacent lots may share a common lot line drainage swale (see Typical Lot Grading Detail).

SUMMARY TABLES

TABLE 1
ONSITE BASIN SUMMARY

Basin ID	Area (Sq. Mi.)	Contributing Basins	Cummulative Area (Sq. Mi.)	% A	% B	% C	% D	Basin Q (cfs)	Cummulative Q (cfs)
100	0.00608	100	0.00608	0	29	29	42	12.7	12.7
101	0.00432	100,101	0.0104	0	29	29	42	9.0	20.9
102	0.00728	101*,102	0.01768	0	29	29	42	15.2	35.6
103	0.00347	102*,103	0.02116	0	29	29	42	7.2	42.7
104	0.00470	103*,104	0.00779	0	29	29	42	16.2	58.8
105	0.00400	105	0.00400	0	29	29	42	8.33	8.33
106	0.00390	105*,106	0.00790	0	29	29	42	8.1	16.1
107	0.00417	106*,107	0.01207	0	29	29	42	8.69	24.7
108	0.00738	108	0.00738	0	29	29	42	15.4	15.4
109	0.00672	108,109	0.0141	0	29	29	42	14.0	29.4
110	0.01450	110	0.01450	0	29	29	42	30.2	30.2
111	0.00315	111	0.00315	33	19	19	29	5.2	5.2
112	0.00292	111*,112	0.00606	0	29	29	42	6.1	11.0
113	0.00627	109*,112*,113	0.02643	0	29	29	42	13.0	52.7
114	0.00737	110*,114	0.02187	0	29	29	42	15.3	45.2
115	0.0063	115	0.0063	0	29	29	42	13.2	13.2
116	0.0052	113*,115,116,117	0.03929	0	29	29	42	10.95	78.8
117	0.00127	117	0.00127	0	29	29	42	2.7	2.7
118	0.0052	114*,119	0.02899	0	29	29	42	10.95	59.7
119	0.00186	119	0.00186	0	29	29	42	3.9	3.9
120	0.0044	107*	0.01651	0	29	29	42	9.3	33.8
121	0.00220	120*	0.01871	0	29	29	42	4.6	38.0
122	0.00784	104*,118*,121*	0.12378	0	29	29	42	16.3	250.6

*Cumulative Q of basin

TABLE 2
Flow Depth at Key Locations

Street	Location	Street Width	Curb Type	Slope (ft/ft)	Q100(cfs)	Depth (ft)
Unit 2						
April Flower Pl	@Spring Canyon	28	MTB	0.018	10.96	0.33
Purple Cone Rd	@Spring Canyon	28	STD	0.014	52.7	0.59
Purple Fringe Rd	@Spring Canyon	28	STD	0.016	45.2	0.54
Saltbrush Rd	@Spring Canyon	28	STD	0.0156	24.7	0.44
Unit 3						
Spring Flower Pl	@Desertwood Dr	32	STD	0.0182	42.7	0.61
Desertwood Dr	@Spring Flower Rd	28	STD	0.006	7.2	0.35
Purple Rock Pl	@Spring Flower Rd	28	STD	0.007	15.2	0.43
Spring Flower Pl	@Spring Flower Rd	28	STD	0.006	12.7	0.42
Unit 4						
Spring Flower Pl	@Saltbrush Rd	28	MTB	0.012	8.1	0.32
Cosmos Dr	@Saltbrush Rd	28	STD	0.01	8.7	0.34
Saltbrush Rd	@Cosmos Dr	28	STD	0.0156	24.7	0.44
Spring Flower Rd	@Cosmos Dr	32	STD	0.0184	58.8	0.58
Unit 5						
Spring Flower Rd	@Amole Del Norte	36	STD	0.013	74.75	0.67
Most Easternly N/S	@Saltbrush Rd	28	STD	0.005	29.7	0.58
Saltbrush Rd	@Most Easternly N/S	28	STD	0.005	38	0.64
Purple Fringe Rd	@Most Easternly N/S	32	STD	0.005	25.89	0.54
Purple Cone Rd	@Most Easternly N/S	32	STD	0.0125	63.45	0.64
April Flower Pl	@Most Easternly N/S	28	STD	0.005	13.2	0.44

* UNIT ONE has been previously approved (WO # 5739.81) and is currently under construction
* Flowrates listed are full street flows

hyd. jumps?

TABLE 3
INLETS CAPACITY AT KEY LOCATIONS

INLET NO.	INLET TYPE	STREET	LOCATION (STA)	STREET WIDTH & CURB TYPE	% SLOPE	Q100	Dn (ft)	Qintercepted (cfs)	Qby-pass (cfs)
*Sumps	2 MOD A's	Purple Cone	At Most Easterly N/S Road	28' FF	-----	78.8	-----	78.8	-----
1 & 2	A	Purple Fringe	≈200' East of Spring Canyon	32' Stand	0.5	45.17	.64	15	30.17
3 & 4	A	Purple Fringe	At Most Easterly N/S Road	32' Stand	0.5	40.89	.63	15	25.89
5 & 6	A	Most Easterly N/S Road	At Saltbrush Road	28' Stand	0.5	29.79	.59	13	16.79

*See attached calculation sheet for sump inlets

Analyze Sump Inlets

$Q_{Required} = 78.8$ CFS

Try Modified Type "A" with Single Grate & Double Throat

Grate Open Area:

Gross Area for One Grate: 2'-1½" x 2'-11 3/8" = 6.28 SQ Ft

Less Bearing Bars: (0.5")1/12 * 2.95 * 13 = -1.60 SQ Ft

Less Cross Bars: (0.5")1/12 * 2.13 * 7 = -0.62 SQ Ft

Plus Intersections (Counted Twice):

(0.5")1/12 x (0.5")1/12 * 77 = + 0.13 SQ FT

Total = 4.2 SQ FT

Clogging Factor = 50%

H = .67' + .17' = .84'

Flow thru the Grate = $CA\sqrt{2gh}$ = $.67\left(\frac{4.19}{2}\right)\sqrt{64.4(.84)}$

= 10.4 CFS

Flow thru double throat = $CA\sqrt{2gh}$

$= .67(.5)(13.4)\sqrt{64.4(.84)}$

= 33.0 CFS

Total Inlet Capacity = 10.4 + 33.0 = 43.4 CFS

2 * 43.4 = 86.8 CFS > 78.8 CFS ✓ OK

TABLE 4
STORM DRAIN CAPACITY

STREET	LOCATION (STA)	SLOPE (%)	PIPE SIZE (in)	DESIGN Q (cfs)	VELOCITIES (fps)	MAXIMUM PIPE CAPACITY (cfs)
Purple Fringe Road	≈200' East of Spring Canyon Drive	0.5	18"	15	8.49	*
Purple Fringe Road	Most Easterly N/S Road	0.5	24"	30	9.55	*
Most Easterly N/S Road	Purple Cone Road	0.5	48"	78.8	6.27	*
Most Easterly N/S Road	Purple Fringe Road	0.5	48"	108.8	8.66	*
Most Easterly N/S Road	Saltbrush Road	0.5	48"	121.8	9.69	*
Saltbrush Road	Amole del Norte Diversion Channel	0.5	54"	121.8	9.86	139.04

*PIPES FUNCTIONING UNDER PRESSURE

Desert Flower Subdivision Temporary Retention Ponds

1. Unit One (100 yr Event) *

Basins 108, 109, 110

V_{360} = 1.53 Ac·Ft

$V_{10\ DAY}$ = 98942 CuFt

* Previously approved under WO # 5739.81

2. Unit Three (100 yr event)

- Basins 100-103
- Area = 13.54 Ac
- Wt E = 1.30 in (Based on 42% D, 29% C, 29% B)

$$V_{360} = \frac{13.54 * 1.3}{12} = 1.47 \text{ Ac·Ft}$$

$$V_{10\ DAY} = 1.47 + \frac{5.69(3.67-2.2)}{12} = 2.17 \text{ Ac·Ft} = 94378 \text{ CuFt.}$$

3. Unit Four

- Basins 100-104

Area = 18.53 Ac

Wt E = 1.30 IN

$$V_{360} = \frac{18.53 * 1.3}{12} = 2.00 \text{ Ac·Ft}$$

$$V_{10\ DAY} = 2 + \frac{7.78(3.67-2.2)}{12} = 2.96 \text{ Ac·Ft} = 128,972 \text{ CuFt}$$

Desert Flower Subdivision Temporary Retention Ponds

3. Unit Three (cont')

$$V_{360} = \frac{13.54 * 1.3}{12} = 1.47 \text{ Ac·Ft}$$

$$V_{10\text{-}DAY} = 1.47 + \frac{5.69(3.67-2.2)}{12} = 2.17 \text{ Ac·Ft} = 94378 \text{ CF}$$

4. Unit Four

- Basins 100 - 104

Area = 18.53 Ac

Wt E = 1.30 IN

$$V_{360} = \frac{18.53 * 1.3}{12} = 2.00 \text{ Ac·Ft}$$

$$V_{10\text{-}Day} = 2 + \frac{7.78(3.67-2.2)}{12} = 2.94 \text{ Ac·Ft} = 128972 \text{ CF}$$

APPENDIX A

ONSITE AHYMO SUMMARY & DETAILED OUTPUT
100-YEAR STORM

ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

Thomas O. Isaacson, PE & LS • Fred C. Arfman, PE
Scott M. McGee, PE

June 4, 1998

Ms. Susan Calongne, P.E.
City/County Floodplain Administrator
2400 Broadway SE
Albuquerque, NM 87102

RE: Desert Flower Revised Master Drainage Report (M10/D5)

Dear Ms. Calongne:

As per our phone discussion on June 4, 1998, I have enclosed a copy of the energy grade line calculations, preliminary channel/rundown calculations, and the revised Figure 1 for incorporation into the drainage report. Please note that all of the energy grade lines for streets at T-intersections have values less than 0.87 feet (typical property line elevation above the flowline).

Also, a review of the number of lots per unit was completed and a few errors were found. The corrected numbers are as follows:

Unit One:	85
Unit Two:	77
Unit Three:	115
Unit Four:	70
Unit Five:	142
Total	489

Please feel free to contact me if you have any further questions.

Sincerely,

ISAACSON & ARFMAN, P.A.

Melissa Combs
MC/rtl

128 Monroe St. NE • Albuquerque, NM 87108 • (505) 268-8828 • FAX (505) 268-2632

Spring Canyon Connection to Amole
Worksheet for Trapezoidal Channel

Project Description	
Project File	c:\haestad\fmw\dtfwrev.fm2
Worksheet	Spring Canyon Channel to Amole
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	6.00	%
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	10.00	ft
Discharge	128.80	cfs

Results		
Depth	0.62	ft
Flow Area	6.92	ft^2
Wetted Perimeter	12.75	ft
Top Width	12.46	ft
Critical Depth	1.55	ft
Critical Slope	0.002423	ft/ft
Velocity	18.62	ft/s
Velocity Head	5.39	ft
Specific Energy	6.00	ft
Froude Number	4.41	
Flow is supercritical.		

Notes:

* Preliminary Channel Sizing
* Assume Concrete Channel

Supplemental Table
Energy Grade Line Calculations

Street	Location	Street Width	Curb Type	Slope (ft/ft)	Q100(cfs)	Depth (ft)	Energy Grade line
Unit 5							
Most Easternly N/S Street	@Saltbrush Rd	28	STD	0.005	29.7	0.58	0.71
Saltbrush Rd	@Most Easternly N/S Street	28	STD	0.005	38	0.64	0.79
Purple Fringe Rd	@Most Easternly N/S Street	32	STD	0.005	25.89	0.54	0.65
April Flower Pl	@Most Easternly N/S Street	28	STD	0.005	13.2	0.44	0.5

* Please note that Purple Cone Rd and Spring Flower Rd both terminate in sump conditions, and therefore the flows do not have to turn

PURPLE CONE RUNDOWN
Worksheet for Trapezoidal Channel

Project Description	
Project File	c:\haestad\fmw\dtfwrev.fm2
Worksheet	Purple Cone Rundown
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.022	
Channel Slope	1.30	%
Left Side Slope	8.00	H : V
Right Side Slope	8.00	H : V
Bottom Width	50.00	ft
Discharge	41.70	cfs

Results		
Depth	0.26	ft
Flow Area	13.61	ft^2
Wetted Perimeter	54.21	ft
Top Width	54.18	ft
Critical Depth	0.27	ft
Critical Slope	0.011012	ft/ft
Velocity	3.06	ft/s
Velocity Head	0.15	ft
Specific Energy	0.41	ft
Froude Number	1.08	
Flow is supercritical.		

Notes:

SLOPE OF THE CHANNEL LISTED IS THE AVERAGE SLOPE

PURPLE FRINGE RUNDOWN
Worksheet for Trapezoidal Channel

Project Description	
Project File	c:\haestad\fmw\dtfwrev.fm2
Worksheet	Purple Fringe Rundown
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.022	
Channel Slope	1.20	%
Left Side Slope	8.00	H : V
Right Side Slope	8.00	H : V
Bottom Width	50.00	ft
Discharge	45.20	cfs

Results		
Depth	0.28	ft
Flow Area	14.66	ft^2
Wetted Perimeter	54.53	ft
Top Width	54.49	ft
Critical Depth	0.29	ft
Critical Slope	0.010827	ft/ft
Velocity	3.08	ft/s
Velocity Head	0.15	ft
Specific Energy	0.43	ft
Froude Number	1.05	
Flow is supercritical.		

Notes:

SLOPE OF THE CHANNEL LISTED IS THE AVERAGE SLOPE

SALTBRUSH RD RUNDOWN
Worksheet for Trapezoidal Channel

Project Description	
Project File	c:\haestad\fmw\dtfwrev.fm2
Worksheet	Saltbrush Rd Rundown
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.022	
Channel Slope	1.00	%
Left Side Slope	8.00	H : V
Right Side Slope	8.00	H : V
Bottom Width	50.00	ft
Discharge	24.70	cfs

Results		
Depth	0.21	ft
Flow Area	10.68	ft^2
Wetted Perimeter	53.33	ft
Top Width	53.31	ft
Critical Depth	0.19	ft
Critical Slope	0.012302	ft/ft
Velocity	2.31	ft/s
Velocity Head	0.08	ft
Specific Energy	0.29	ft
Froude Number	0.91	
Flow is subcritical.		

Notes:

SLOPE OF THE CHANNEL LISTED IS THE AVERAGE SLOPE

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =05/06/1998
INPUT FILE = dstmesa2.dat USER NO.= ISCARFNM.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1 NOTATION
*S	DESERT FLOWER SUBDIVISION - 100 YR POST DEVELOPMENT									
*S	DSTmesa2.DAT									
*S	REVISED BY: mjc 5/05/98									
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.200
*S BASIN 100: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	100.00	-	1	.00608	12.66	.421	1.29860	1.500	3.253	PER IMP= 42.00
*S ** ROUTE BASIN 100 THROUGH 101										
ROUTE	100.10	1	2	.00608	12.22	.421	1.29863	1.533	3.141	
*S BASIN 101: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	101.00	-	3	.00432	9.00	.299	1.29860	1.500	3.255	PER IMP= 42.00
*S COMBINE BASINS 100 AND 101 TOGETHER										
ADD HYD	101.10	2& 3	4	.01040	20.93	.720	1.29854	1.533	3.144	
*S BASIN 102: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	102.00	-	5	.00728	15.16	.504	1.29860	1.500	3.252	PER IMP= 42.00
*S COMBINE BASIN 102 TO HYDROGRAPH NO 101.1										
ADD HYD	102.10	4& 5	6	.01769	35.60	1.225	1.29855	1.533	3.146	
*S BASIN 103: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	103.00	-	7	.00347	7.23	.240	1.29860	1.500	3.256	PER IMP= 42.00
*S COMBINE BASINS 103 AND HYDROGRAPH NO. 102.1 TOGETHER										
ADD HYD	103.10	6& 7	8	.02116	42.71	1.465	1.29854	1.500	3.155	
*S ** ROUTE BASIN 103.1 THROUGH 104										
ROUTE	103.20	8	9	.02116	43.08	1.465	1.29857	1.533	3.182	
*S BASIN 104: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	140.00	-	10	.00779	16.21	.540	1.29860	1.500	3.252	PER IMP= 42.00
*S COMBINE BASIN 104 AND HYDROGRAPH 103.2 TOGETHER										
ADD HYD	104.10	9&10	30	.02895	58.77	2.005	1.29855	1.533	3.172	
*S BASIN 105: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	105.00	-	13	.00400	8.33	.277	1.29860	1.500	3.255	PER IMP= 42.00
*S ** ROUTE BASIN 105 THROUGH 106										
ROUTE	105.10	13	14	.00400	8.22	.277	1.29865	1.533	3.210	
*S BASIN 106: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	106.10	-	15	.00390	8.13	.270	1.29860	1.500	3.255	PER IMP= 42.00
*S COMBINE BASINS 106 AND 105.1 TOGETHER										
ADD HYD	106.10	15&14	16	.00790	16.08	.547	1.29853	1.533	3.181	
*S ** ROUTE BASIN 106.1 THROUGH 107										
ROUTE	106.20	16	17	.00790	16.26	.547	1.29859	1.533	3.217	
*S BASIN 107: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	107.00	-	18	.00417	8.69	.289	1.29860	1.500	3.255	PER IMP= 42.00
*S COMBINE HYDROGRAPH NO 106.2 AND 107 TOGETHER										
ADD HYD	107.10	18&17	20	.01207	24.67	.836	1.29853	1.533	3.193	
*S BASIN 108: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	108.00	-	1	.00738	15.37	.511	1.29860	1.500	3.252	PER IMP= 42.00
*S BASIN 109: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	109.00	-	2	.00672	13.99	.465	1.29860	1.500	3.252	PER IMP= 42.00
*S COMBINE BASINS 108 AND 109 TOGETHER										
ADD HYD	109.10	1& 2	3	.01410	29.36	.977	1.29855	1.500	3.252	
*S ** ROUTE BASIN 109.1 THROUGH 113										
ROUTE	109.20	3	4	.01410	29.20	.977	1.29859	1.533	3.235	
*S BASIN 110: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
COMPUTE NM HYD	110.00	-	5	.01450	30.16	1.004	1.29860	1.500	3.250	PER IMP= 42.00
*S ** ROUTE BASIN 110 THROUGH 114										
ROUTE	110.10	5	6	.01450	30.00	1.004	1.29861	1.533	3.232	
*S BASIN 111: PARK										
COMPUTE NM HYD	111.00	-	7	.00315	5.20	.169	1.00753	1.500	2.579	PER IMP= 29.00
*S ** ROUTE BASIN 111 THROUGH 112										
ROUTE	111.10	7	8	.00315	5.08	.169	1.00760	1.533	2.519	
*S BASIN 112: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	112.00	-	9	.00292	6.08	.202	1.29860	1.500	3.257	PER IMP= 42.00
*S COMBINE BASINS 111.1 AND 112 TOGETHER										
ADD HYD	112.10	8& 9	10	.00606	10.96	.371	1.14736	1.533	2.823	
*S ** ROUTE BASIN 112.1 THROUGH 113										
ROUTE	112.20	10	21	.00606	10.87	.371	1.14745	1.533	2.802	
*S BASIN 113: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	113.00	-	12	.00627	13.04	.434	1.29860	1.500	3.253	PER IMP= 42.00
*S COMBINE BASINS 113 AND 112.2 TOGETHER										
ADD HYD	113.10	21&12	13	.01233	23.49	.805	1.22419	1.533	2.978	
*S COMBINE BASINS 113 AND 109.2 TOGETHER										
ADD HYD	113.20	13& 4	14	.02643	52.69	1.782	1.26387	1.533	3.115	
*S BASIN 114: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	114.00	-	16	.00737	15.34	.510	1.29860	1.500	3.252	PER IMP= 42.00
*S COMBINE BASINS 110.1 AND 114 TOGETHER										
ADD HYD	114.10	16& 6	17	.02187	45.17	1.515	1.29857	1.500	3.227	
*S BASIN 115: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	115.00	-	18	.00633	13.18	.438	1.29860	1.500	3.253	PER IMP= 42.00
*S ** ROUTE BASIN 113.2 THROUGH 116										
ROUTE	113.30	14	19	.02643	52.85	1.782	1.26391	1.533	3.124	
*S BASIN 116: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	116.00	-	22	.00526	10.95	.364	1.29860	1.500	3.254	PER IMP= 42.00
*S COMBINE BASINS 116 AND 113.3 TOGETHER										
ADD HYD	116.10	19&22	1	.03169	63.45	2.146	1.26965	1.533	3.128	
*S COMBINE BASINS 116.1 AND 115 TOGETHER										
ADD HYD	116.20	1&18	2	.03802	76.21	2.584	1.27446	1.533	3.132	
*S BASIN 117: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	117.00	-	3	.00127	2.66	.088	1.29860	1.500	3.268	PER IMP= 42.00
*S COMBINE BASINS 116.2 AND 117 TOGETHER										
ADD HYD	117.10	2& 3	4	.03929	78.78	2.672	1.27523	1.533	3.133	
*S ** ROUTE BASIN 114.1 THROUGH 118										
ROUTE	114.20	17	5	.02187	45.29	1.515	1.29859	1.533	3.236	
*S BASIN 118: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	118.00	-	6	.00526	10.95	.364	1.29860	1.500	3.254	PER IMP= 42.00
*S COMBINE BASINS 118 AND 114.2 TOGETHER										
ADD HYD	118.10	6& 5	7	.02713	55.89	1.879	1.29857	1.533	3.219	
*S BASIN 119: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	119.00	-	8	.00186	3.88	.129	1.29860	1.500	3.263	PER IMP= 42.00
*S COMBINE BASINS 118.1 AND 119 TOGETHER										
ADD HYD	118.20	8& 7	9	.02899	59.65	2.008	1.29856	1.533	3.215	
*S ** ROUTE BASIN 107.2 THROUGH 120										
ROUTE	107.30	20	10	.01207	24.80	.836	1.29858	1.533	3.211	
*S BASIN 120: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	120.00	-	11	.00444	9.25	.308	1.29860	1.500	3.255	PER IMP= 42.00
*S COMBINE BASINS 120 AND 107.2 TOGETHER										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	120.10	11&10	12	.01651	33.75	1.143	1.29854	1.533	3.194	
*S ** ROUTE BASIN 120.1 THROUGH 121										
ROUTE	120.20	12	13	.01651	33.52	1.144	1.29857	1.533	3.173	
*S BASIN 121: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	121.00	-	14	.00220	4.59	.152	1.29860	1.500	3.260	PER IMP= 42.00
*S COMBINE BASINS 121 AND 120.2 TOGETHER										
ADD HYD	121.10	14&13	15	.01871	37.97	1.296	1.29853	1.533	3.171	
*S ** ROUTE BASIN 104.1 THROUGH 122										
ROUTE	104.20	30	23	.02895	58.43	2.005	1.29857	1.533	3.154	
*S BASIN 122: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	122.00	-	16	.00784	16.32	.543	1.29860	1.500	3.252	PER IMP= 42.00
*S COMBINE BASINS 122 AND 121.1 TOGETHER										
ADD HYD	122.10	16&15	17	.02655	53.76	1.839	1.29854	1.533	3.164	
*S COMBINE BASINS 122.1 AND 118.2 TOGETHER										
ADD HYD	122.20	17& 9	18	.05554	113.41	3.847	1.29855	1.533	3.190	
*S COMBINE BASINS 122.2 AND 117.1 TOGETHER										
ADD HYD	122.30	18& 4	19	.09483	192.18	6.519	1.28889	1.533	3.166	
*S COMBINE BASINS 122.3 AND 104.2 TOGETHER										
ADD HYD	122.40	19&23	20	.12378	250.61	8.524	1.29115	1.533	3.164	
*S OFFSITE BASINS: UNSER BLVD										
*S BASIN 201.1: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)										
COMPUTE NM HYD	201.10	-	1	.00073	1.70	.059	1.50556	1.500	3.630	PER IMP= 60.00
*S BASIN 201.2: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)										
COMPUTE NM HYD	201.20	-	2	.00281	6.49	.226	1.50556	1.500	3.606	PER IMP= 60.00
*S BASIN 201.3: OFFSITE: UNSER BLVD. MEDIAN AREA										
COMPUTE NM HYD	201.30	-	3	.00215	4.96	.172	1.50556	1.500	3.608	PER IMP= 60.00
FINISH										

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AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 05/07/1998
     START TIME (HR:MIN:SEC) = 10:37:32     USER NO.= ISCARFNM.I01
     INPUT FILE = dstmesa2.dat

*S                DESERT FLOWER SUBDIVISION - 100 YR POST DEVELOPMENT
*S                DSRTmesa.DAT
*S                REVISED BY: mjc 5/05/98
*
START             RAINFALL BEGINS AT 0.0 HRS
RAINFALL          TYPE=1 RAIN QUARTER=0 RAIN ONE=1.87
                  RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333HR

            COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
            DT =    .033330 HOURS       END TIME =     5.999400 HOURS
               .0000   .0016   .0033   .0050   .0067   .0085   .0103
               .0122   .0141   .0160   .0180   .0201   .0222   .0243
               .0266   .0289   .0312   .0337   .0362   .0388   .0415
               .0443   .0472   .0502   .0534   .0567   .0601   .0637
               .0675   .0715   .0758   .0809   .0865   .0924   .1050
               .1334   .1771   .2398   .3254   .4379   .5814   .7600
               .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
              1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
              1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
              1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
              1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
              2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
              2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
              2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
              2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
              2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
              2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  2.1159
              2.1176  2.1193  2.1210  2.1227  2.1244  2.1260  2.1276
              2.1292  2.1308  2.1324  2.1340  2.1355  2.1371  2.1386
              2.1401  2.1416  2.1431  2.1446  2.1460  2.1475  2.1489
              2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
              2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
              2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
              2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
              2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
              2.1944  2.1956  2.1967  2.1978  2.1989  2.2000

*S BASIN 100: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=1 HYD NO=100.00 AREA=0.00608 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    10.082    CFS   UNIT VOLUME =     .9982        B =   526.28       P60 = 1.8700
    AREA =       .002554 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330
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K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =   9.3826    CFS   UNIT VOLUME =    .9991        B =   354.67      P60 = 1.8700
AREA =      .003526 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1   CODE=1

                                  PARTIAL HYDROGRAPH   100.00


RUNOFF VOLUME =     1.29860 INCHES     =        .4211 ACRE-FEET
PEAK DISCHARGE RATE =      12.66 CFS  AT   1.500 HOURS   BASIN AREA =   .0061 SQ. MI.


*S ** ROUTE BASIN 100 THROUGH 101
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67

                                  RATING CURVE VALLEY SECTION  1.0
                                      WATER       FLOW        FLOW        TOP
                                     SURFACE      AREA        RATE       WIDTH
                                      ELEV       SQ FT        CFS         FT
                                     100.00        .00         .00         .00
                                     100.04        .06         .05        3.51
                                     100.07        .25         .33        7.03
                                     100.11        .56         .96       10.54
                                     100.14        .99        2.07       14.06
                                     100.18       1.55        3.75       17.57
                                     100.21       2.23        6.10       21.09
                                     100.25       3.04        9.20       24.60
                                     100.28       3.97       13.13       28.12
                                     100.32       5.02       17.98       31.63
                                     100.35       6.14       25.01       31.91
                                     100.39       7.27       33.05       31.92
                                     100.42       8.40       41.95       31.93
                                     100.46       9.52       51.67       31.94
                                     100.49      10.65       62.16       31.95
                                     100.53      11.77       73.40       31.96
                                     100.56      12.90       85.36       31.97
                                     100.60      14.03       98.01       31.98
                                     100.63      15.16      111.33       31.99
                                     100.67      16.28      125.31       32.00
COMPUTE TRAVEL TIME  ID=2 REACH NO=1 NO VS=1 L=410 FT
                     SLP=.016

                              TRAVEL TIME TABLE
                                          REACH=  1.0
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```
                                WATER        AVERAGE      FLOW         TRAVEL
                                DEPTH        AREA         RATE         TIME
                                FEET         SQ.FT.       CFS          HRS
                                   .035         .062          .05        .1376
                                   .071         .248          .33        .0867
                                   .106         .558          .96        .0661
                                   .141         .992         2.07        .0546
                                   .176        1.549         3.75        .0471
                                   .212        2.231         6.10        .0417
                                   .247        3.037         9.20        .0376
                                   .282        3.966        13.13        .0344
                                   .317        5.020        17.98        .0318
                                   .353        6.144        25.01        .0280
                                   .388        7.269        33.05        .0250
                                   .423        8.395        41.95        .0228
                                   .458        9.521        51.67        .0210
                                   .494       10.647        62.16        .0195
                                   .529       11.774        73.40        .0183
                                   .564       12.901        85.36        .0172
                                   .599       14.029        98.01        .0163
                                   .635       15.157       111.33        .0155
                                   .670       16.285       125.31        .0148
ROUTE                  ID=2 HYD NO=100.1 INFLOW ID=1 DT=0.0 HR
PRINT HYD              ID=2 CODE=1

                                   PARTIAL HYDROGRAPH   100.10

    RUNOFF VOLUME =      1.29863 INCHES      =         .4211 ACRE-FEET
    PEAK DISCHARGE RATE =       12.22 CFS  AT   1.533 HOURS   BASIN AREA =   .0061 SQ. MI.


*S BASIN 101: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD         ID=3 HYD NO=101.00 AREA=0.004321 SQ MI
                       PER A=0 PER B=29 PER C=29 PER D=42
                       TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.1650    CFS   UNIT VOLUME =     .9978       B =   526.28      P60 = 1.8700
    AREA =       .001815 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   6.6681    CFS   UNIT VOLUME =     .9984       B =   354.67      P60 = 1.8700
    AREA =       .002506 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD              ID=3   CODE=1
```

```
                                PARTIAL HYDROGRAPH   101.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .2993 ACRE-FEET
    PEAK DISCHARGE RATE =        9.00 CFS  AT   1.500 HOURS   BASIN AREA =   .0043 SQ. MI.


*S COMBINE BASINS 100 AND 101 TOGETHER
ADD HYD              ID=4  HYD NO=101.1  ID=2  ID=3
PRINT HYD            ID=4  CODE=1

                                PARTIAL HYDROGRAPH   101.10

    RUNOFF VOLUME =      1.29854 INCHES      =         .7203 ACRE-FEET
    PEAK DISCHARGE RATE =       20.93 CFS  AT   1.533 HOURS   BASIN AREA =   .0104 SQ. MI.


*S BASIN 102: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=5 HYD NO=102.00 AREA=0.007284 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   12.078    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .003059 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   11.241    CFS   UNIT VOLUME =    .9993       B =   354.67      P60 = 1.8700
    AREA =      .004225 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=5   CODE=1

                                PARTIAL HYDROGRAPH   102.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .5045 ACRE-FEET
    PEAK DISCHARGE RATE =       15.16 CFS  AT   1.500 HOURS   BASIN AREA =   .0073 SQ. MI.


*S COMBINE BASIN 102 TO HYDROGRAPH NO 101.1
ADD HYD              ID=6  HYD NO=102.1  ID=4  ID=5
PRINT HYD            ID=6  CODE=1
```

```
                                PARTIAL HYDROGRAPH   102.10

    RUNOFF VOLUME =     1.29855 INCHES     =       1.2248 ACRE-FEET
    PEAK DISCHARGE RATE =      35.60 CFS  AT   1.533 HOURS   BASIN AREA =   .0177 SQ. MI.


*S BASIN 103: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=7 HYD NO=103.00 AREA=0.00347 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.7539    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =      .001457 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   5.3549    CFS   UNIT VOLUME =    .9980       B =   354.67      P60 = 1.8700
    AREA =      .002013 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=7   CODE=1

                                PARTIAL HYDROGRAPH   103.00

    RUNOFF VOLUME =     1.29860 INCHES     =        .2403 ACRE-FEET
    PEAK DISCHARGE RATE =       7.23 CFS  AT   1.500 HOURS   BASIN AREA =   .0035 SQ. MI.


*S COMBINE BASINS 103 AND HYDROGRAPH NO. 102.1 TOGETHER
ADD HYD             ID=8  HYD NO=103.1 ID=6  ID=7
PRINT HYD           ID=8  CODE=1

                                PARTIAL HYDROGRAPH   103.10

    RUNOFF VOLUME =     1.29854 INCHES     =       1.4651 ACRE-FEET
    PEAK DISCHARGE RATE =      42.71 CFS  AT   1.500 HOURS   BASIN AREA =   .0212 SQ. MI.


*S ** ROUTE BASIN 103.1 THROUGH 104
COMPUTE TRAVEL TIME  ID=9 REACH NO=1 NO VS=1 L=520 FT
                     SLP=.0171
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1745
.071	.248	.33	.1099
.106	.558	.96	.0839
.141	.992	2.07	.0692
.176	1.549	3.75	.0597
.212	2.231	6.10	.0528
.247	3.037	9.20	.0477
.282	3.966	13.13	.0436
.317	5.020	17.98	.0403
.353	6.144	25.01	.0355
.388	7.269	33.05	.0318
.423	8.395	41.95	.0289
.458	9.521	51.67	.0266
.494	10.647	62.16	.0247
.529	11.774	73.40	.0232
.564	12.901	85.36	.0218
.599	14.029	98.01	.0207
.635	15.157	111.33	.0197
.670	16.285	125.31	.0188

```
ROUTE                ID=9 HYD NO=103.2 INFLOW ID=8 DT=0.0 HR
PRINT HYD            ID=9 CODE=1
```

PARTIAL HYDROGRAPH 103.20

```
RUNOFF VOLUME =      1.29857 INCHES     =       1.4651 ACRE-FEET
PEAK DISCHARGE RATE =      43.08 CFS  AT   1.533 HOURS   BASIN AREA =   .0212 SQ. MI.


*S BASIN 104: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=10 HYD NO=140.00 AREA=0.00779 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   12.917    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.8700
AREA =       .003272 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =   12.021    CFS   UNIT VOLUME =    .9993       B =   354.67      P60 = 1.8700
AREA =       .004518 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
PRINT HYD            ID=10   CODE=1

                                   PARTIAL HYDROGRAPH   140.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .5395 ACRE-FEET
    PEAK DISCHARGE RATE =      16.21 CFS  AT   1.500 HOURS   BASIN AREA =   .0078 SQ. MI.


*S COMBINE BASIN 104 AND HYDROGRAPH 103.2 TOGETHER
ADD HYD              ID=30  HYD NO=104.1  ID=9  ID=10
PRINT HYD            ID=30  CODE=1

                                   PARTIAL HYDROGRAPH   104.10

    RUNOFF VOLUME =      1.29855 INCHES      =        2.0046 ACRE-FEET
    PEAK DISCHARGE RATE =      58.77 CFS  AT   1.533 HOURS   BASIN AREA =   .0289 SQ. MI.


*S BASIN 105: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=13  HYD NO=105.00 AREA=0.004 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.6327    CFS   UNIT VOLUME =    .9976       B =   526.28      P60 = 1.8700
    AREA =      .001680 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   6.1728    CFS   UNIT VOLUME =    .9982       B =   354.67      P60 = 1.8700
    AREA =      .002320 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=13  CODE=1

                                   PARTIAL HYDROGRAPH   105.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .2770 ACRE-FEET
    PEAK DISCHARGE RATE =       8.33 CFS  AT   1.500 HOURS   BASIN AREA =   .0040 SQ. MI.
```

```
*S ** ROUTE BASIN 105 THROUGH 106
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=28 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   14   100.28
                     27.9 100.00 28.0 100.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.02
100.11	.56	.96	10.53
100.14	.99	2.07	14.05
100.18	1.55	3.75	17.56
100.21	2.23	6.09	21.07
100.25	3.03	9.19	24.58
100.28	3.96	13.18	27.88
100.32	4.95	19.05	27.89
100.35	5.93	25.73	27.91
100.39	6.91	33.18	27.92
100.42	7.90	41.35	27.93
100.46	8.88	50.21	27.94
100.49	9.87	59.73	27.95
100.53	10.85	69.89	27.96
100.56	11.84	80.66	27.97
100.60	12.83	92.01	27.98
100.63	13.81	103.94	27.99
100.67	14.80	116.42	28.00

```
COMPUTE TRAVEL TIME  ID=14 REACH NO=1 NO VS=1 L=260 FT
                     SLP=.019
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0872
.071	.248	.33	.0550
.106	.557	.96	.0419
.141	.991	2.07	.0346
.176	1.548	3.75	.0298
.212	2.229	6.09	.0264
.247	3.034	9.19	.0238
.282	3.962	13.18	.0217
.317	4.946	19.05	.0188
.353	5.930	25.73	.0166
.388	6.914	33.18	.0151

```
                                .423        7.898        41.35        .0138
                                .458        8.883        50.21        .0128
                                .494        9.869        59.73        .0119
                                .529       10.854        69.89        .0112
                                .564       11.841        80.66        .0106
                                .599       12.827        92.01        .0101
                                .635       13.814       103.94        .0096
                                .670       14.801       116.42        .0092
ROUTE                 ID=14 HYD NO=105.1 INFLOW ID=13 DT=0.0 HR
PRINT HYD             ID=14 CODE=1

                                PARTIAL HYDROGRAPH   105.10


    RUNOFF VOLUME =      1.29865 INCHES      =         .2770 ACRE-FEET
    PEAK DISCHARGE RATE =        8.22 CFS  AT   1.533 HOURS   BASIN AREA =   .0040 SQ. MI.


*S BASIN 106: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD        ID=15  HYD NO=106.10 AREA=0.0039 SQ MI
                      PER A=0 PER B=29 PER C=29 PER D=42
                      TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.4669    CFS   UNIT VOLUME =     .9976       B =   526.28      P60 = 1.8700
    AREA =       .001638 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   6.0185    CFS   UNIT VOLUME =     .9982       B =   354.67      P60 = 1.8700
    AREA =       .002262 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD             ID=15   CODE=1

                                PARTIAL HYDROGRAPH   106.10


    RUNOFF VOLUME =      1.29860 INCHES      =         .2701 ACRE-FEET
    PEAK DISCHARGE RATE =        8.13 CFS  AT   1.500 HOURS   BASIN AREA =   .0039 SQ. MI.


*S COMBINE BASINS 106 AND 105.1 TOGETHER
ADD HYD               ID=16  HYD NO=106.1  ID=15  ID=14
PRINT HYD             ID=16  CODE=1
```

PARTIAL HYDROGRAPH 106.10

RUNOFF VOLUME = 1.29853 INCHES = .5471 ACRE-FEET
PEAK DISCHARGE RATE = 16.08 CFS AT 1.533 HOURS BASIN AREA = .0079 SQ. MI.

```
*S ** ROUTE BASIN 106.1 THROUGH 107
COMPUTE TRAVEL TIME  ID=17 REACH NO=1 NO VS=1 L=260 FT
                     SLP=.017
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0872
.071	.248	.33	.0550
.106	.557	.96	.0419
.141	.991	2.07	.0346
.176	1.548	3.75	.0298
.212	2.229	6.09	.0264
.247	3.034	9.19	.0238
.282	3.962	13.18	.0217
.317	4.946	19.05	.0188
.353	5.930	25.73	.0166
.388	6.914	33.18	.0151
.423	7.898	41.35	.0138
.458	8.883	50.21	.0128
.494	9.869	59.73	.0119
.529	10.854	69.89	.0112
.564	11.841	80.66	.0106
.599	12.827	92.01	.0101
.635	13.814	103.94	.0096
.670	14.801	116.42	.0092

```
ROUTE                ID=17 HYD NO=106.2 INFLOW ID=16 DT=0.0 HR
PRINT HYD            ID=17 CODE=1
```

PARTIAL HYDROGRAPH 106.20

RUNOFF VOLUME = 1.29859 INCHES = .5471 ACRE-FEET
PEAK DISCHARGE RATE = 16.26 CFS AT 1.533 HOURS BASIN AREA = .0079 SQ. MI.

```
*S BASIN 107: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=18  HYD NO=107.0  AREA=0.004171 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1
```

++++

```
    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    6.9163    CFS   UNIT VOLUME =     .9978       B =   526.28      P60 = 1.8700
    AREA =       .001752 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    6.4367    CFS   UNIT VOLUME =     .9984       B =   354.67      P60 = 1.8700
    AREA =       .002419 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=18  CODE=1

                                   PARTIAL HYDROGRAPH   107.00


    RUNOFF VOLUME =     1.29860 INCHES     =        .2889 ACRE-FEET
    PEAK DISCHARGE RATE =       8.69 CFS  AT   1.500 HOURS   BASIN AREA =   .0042 SQ. MI.


*S COMBINE HYDROGRAPH NO 106.2 AND 107 TOGETHER
ADD HYD             ID=20  HYD NO=107.1  ID=18  ID=17
PRINT HYD           ID=20  CODE=1

                                   PARTIAL HYDROGRAPH   107.10


    RUNOFF VOLUME =     1.29853 INCHES     =        .8360 ACRE-FEET
    PEAK DISCHARGE RATE =      24.67 CFS  AT   1.533 HOURS   BASIN AREA =   .0121 SQ. MI.


*S BASIN 108: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=1  HYD NO=108.0  AREA=0.007383 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   12.242    CFS   UNIT VOLUME =     .9984       B =   526.28      P60 = 1.8700
    AREA =       .003101 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   11.393    CFS   UNIT VOLUME =     .9993       B =   354.67      P60 = 1.8700
    AREA =       .004282 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1  CODE=1
```

```
                                PARTIAL HYDROGRAPH   108.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .5113 ACRE-FEET
    PEAK DISCHARGE RATE =       15.37 CFS  AT   1.500 HOURS   BASIN AREA =   .0074 SQ. MI.


*S BASIN 109: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=2  HYD NO=109.0  AREA=0.00672 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   11.143    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .002822 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   10.370    CFS   UNIT VOLUME =    .9992       B =   354.67      P60 = 1.8700
    AREA =      .003898 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=2  CODE=1

                                PARTIAL HYDROGRAPH   109.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .4654 ACRE-FEET
    PEAK DISCHARGE RATE =       13.99 CFS  AT   1.500 HOURS   BASIN AREA =   .0067 SQ. MI.


*S COMBINE BASINS 108 AND 109 TOGETHER
ADD HYD              ID=3  HYD NO=109.1  ID=1  ID=2
PRINT HYD            ID=3  CODE=1

                                PARTIAL HYDROGRAPH   109.10

    RUNOFF VOLUME =      1.29855 INCHES      =         .9767 ACRE-FEET
    PEAK DISCHARGE RATE =       29.36 CFS  AT   1.500 HOURS   BASIN AREA =   .0141 SQ. MI.


*S ** ROUTE BASIN 109.1 THROUGH 113
COMPUTE TRAVEL TIME  ID=4 REACH NO=1 NO VS=1 L=260 FT
                     SLP=.014
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0872
.071	.248	.33	.0550
.106	.557	.96	.0419
.141	.991	2.07	.0346
.176	1.548	3.75	.0298
.212	2.229	6.09	.0264
.247	3.034	9.19	.0238
.282	3.962	13.18	.0217
.317	4.946	19.05	.0188
.353	5.930	25.73	.0166
.388	6.914	33.18	.0151
.423	7.898	41.35	.0138
.458	8.883	50.21	.0128
.494	9.869	59.73	.0119
.529	10.854	69.89	.0112
.564	11.841	80.66	.0106
.599	12.827	92.01	.0101
.635	13.814	103.94	.0096
.670	14.801	116.42	.0092

```
ROUTE          ID=4 HYD NO=109.2 INFLOW ID=3 DT=0.0 HR
PRINT HYD      ID=4 CODE=1
```

PARTIAL HYDROGRAPH 109.20

```
RUNOFF VOLUME =      1.29859 INCHES      =        .9767 ACRE-FEET
PEAK DISCHARGE RATE =      29.20 CFS  AT   1.533 HOURS   BASIN AREA =   .0141 SQ. MI.


*S BASIN 110: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=5  HYD NO=110.0  AREA=0.0145 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   24.044    CFS   UNIT VOLUME =     .9989       B =   526.28      P60 = 1.8700
AREA =       .006090 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =   22.376    CFS   UNIT VOLUME =     .9999       B =   354.67      P60 = 1.8700
AREA =       .008410 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330
```

```
PRINT HYD            ID=5  CODE=1

                                   PARTIAL HYDROGRAPH   110.00

    RUNOFF VOLUME =      1.29860 INCHES      =        1.0042 ACRE-FEET
    PEAK DISCHARGE RATE =       30.16 CFS  AT   1.500 HOURS   BASIN AREA =   .0145 SQ. MI.


*S ** ROUTE BASIN 110 THROUGH 114
COMPUTE TRAVEL TIME  ID=6 REACH NO=1 NO VS=1 L=260 FT
                     SLP=.0155

                              TRAVEL TIME TABLE
                                          REACH=  1.0

                              WATER       AVERAGE     FLOW        TRAVEL
                              DEPTH       AREA        RATE        TIME
                              FEET        SQ.FT.      CFS         HRS
                                 .035        .062         .05       .0872
                                 .071        .248         .33       .0550
                                 .106        .557         .96       .0419
                                 .141        .991        2.07       .0346
                                 .176       1.548        3.75       .0298
                                 .212       2.229        6.09       .0264
                                 .247       3.034        9.19       .0238
                                 .282       3.962       13.18       .0217
                                 .317       4.946       19.05       .0188
                                 .353       5.930       25.73       .0166
                                 .388       6.914       33.18       .0151
                                 .423       7.898       41.35       .0138
                                 .458       8.883       50.21       .0128
                                 .494       9.869       59.73       .0119
                                 .529      10.854       69.89       .0112
                                 .564      11.841       80.66       .0106
                                 .599      12.827       92.01       .0101
                                 .635      13.814      103.94       .0096
                                 .670      14.801      116.42       .0092
ROUTE                ID=6 HYD NO=110.1 INFLOW ID=5 DT=0.0 HR
PRINT HYD            ID=6 CODE=1

                                   PARTIAL HYDROGRAPH   110.10

    RUNOFF VOLUME =      1.29861 INCHES      =        1.0043 ACRE-FEET
    PEAK DISCHARGE RATE =       30.00 CFS  AT   1.533 HOURS   BASIN AREA =   .0145 SQ. MI.
```

```
*S BASIN 111: PARK
COMPUTE NM HYD       ID=7  HYD NO=111.0  AREA=0.003149 SQ MI
                     PER A=33  PER B=19  PER C=19  PER D=29
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   3.6054    CFS   UNIT VOLUME =    .9961       B =   526.28      P60 = 1.8700
    AREA =      .000913 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   5.2171    CFS   UNIT VOLUME =    .9973       B =   311.05      P60 = 1.8700
    AREA =      .002236 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=7  CODE=1

                                  PARTIAL HYDROGRAPH   111.00


    RUNOFF VOLUME =     1.00753 INCHES     =        .1692 ACRE-FEET
    PEAK DISCHARGE RATE =       5.20 CFS  AT   1.500 HOURS   BASIN AREA =   .0031 SQ. MI.


*S ** ROUTE BASIN 111 THROUGH 112
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.33 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=28 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.33 0.1  100.00   14   100.28
                     27.9 100.00 28.0 100.33
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.02	.02	.01	1.74
100.03	.06	.05	3.47
100.05	.14	.15	5.21
100.07	.24	.31	6.94
100.09	.38	.57	8.68
100.10	.54	.93	10.41
100.12	.74	1.40	12.15
100.14	.96	2.00	13.88
100.16	1.22	2.73	15.62
100.17	1.51	3.62	17.35
100.19	1.82	4.67	19.09
100.21	2.17	5.88	20.82
100.23	2.55	7.28	22.56

100.24	2.95	8.88	24.29
100.26	3.39	10.67	26.03
100.28	3.86	12.67	27.77
100.30	4.34	15.35	27.98
100.31	4.83	18.31	27.99
100.33	5.32	21.46	28.00

```
COMPUTE TRAVEL TIME  ID=8 REACH NO=1 NO VS=1 L=300 FT
                     SLP=.018
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.017	.015	.01	.1611
.035	.060	.05	.1015
.052	.136	.15	.0775
.069	.241	.31	.0639
.087	.377	.57	.0551
.104	.543	.93	.0488
.122	.739	1.40	.0440
.139	.965	2.00	.0403
.156	1.221	2.73	.0372
.174	1.507	3.62	.0347
.191	1.824	4.67	.0326
.208	2.171	5.88	.0307
.226	2.547	7.28	.0291
.243	2.954	8.88	.0277
.261	3.391	10.67	.0265
.278	3.859	12.67	.0254
.295	4.345	15.35	.0236
.313	4.831	18.31	.0220
.330	5.317	21.46	.0206

```
ROUTE                ID=8 HYD NO=111.1 INFLOW ID=7 DT=0.0 HR
PRINT HYD            ID=8 CODE=1
```

PARTIAL HYDROGRAPH 111.10

```
RUNOFF VOLUME =      1.00760 INCHES      =        .1692 ACRE-FEET
PEAK DISCHARGE RATE =        5.08 CFS  AT   1.533 HOURS   BASIN AREA =   .0031 SQ. MI.
```

```
*S BASIN 112: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=9  HYD NO=112.0  AREA=0.002915 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1
```

```
K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =    4.8336    CFS   UNIT VOLUME =    .9969       B =   526.28      P60 = 1.8700
AREA =       .001224 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =    4.4984    CFS   UNIT VOLUME =    .9975       B =   354.67      P60 = 1.8700
AREA =       .001691 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=9  CODE=1

                                PARTIAL HYDROGRAPH   112.00


RUNOFF VOLUME =     1.29860 INCHES     =        .2019 ACRE-FEET
PEAK DISCHARGE RATE =       6.08 CFS  AT   1.500 HOURS   BASIN AREA =   .0029 SQ. MI.


*S COMBINE BASINS 111.1 AND 112 TOGETHER
ADD HYD             ID=10  HYD NO=112.1  ID=8  ID=9
PRINT HYD           ID=10  CODE=1

                                PARTIAL HYDROGRAPH   112.10


RUNOFF VOLUME =     1.14736 INCHES     =        .3711 ACRE-FEET
PEAK DISCHARGE RATE =      10.96 CFS  AT   1.533 HOURS   BASIN AREA =   .0061 SQ. MI.


*S ** ROUTE BASIN 112.1 THROUGH 113
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                     0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09

100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=21 REACH NO=1 NO VS=1 L=260 FT
SLP=.006

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0872
.071	.248	.33	.0550
.106	.558	.96	.0419
.141	.992	2.07	.0346
.176	1.549	3.75	.0298
.212	2.231	6.10	.0264
.247	3.037	9.20	.0238
.282	3.966	13.13	.0218
.317	5.020	17.98	.0202
.353	6.144	25.01	.0177
.388	7.269	33.05	.0159
.423	8.395	41.95	.0145
.458	9.521	51.67	.0133
.494	10.647	62.16	.0124
.529	11.774	73.40	.0116
.564	12.901	85.36	.0109
.599	14.029	98.01	.0103
.635	15.157	111.33	.0098
.670	16.285	125.31	.0094

ROUTE ID=21 HYD NO=112.2 INFLOW ID=10 DT=0.0 HR
PRINT HYD ID=21 CODE=1

PARTIAL HYDROGRAPH 112.20

RUNOFF VOLUME = 1.14745 INCHES = .3711 ACRE-FEET
PEAK DISCHARGE RATE = 10.87 CFS AT 1.533 HOURS BASIN AREA = .0061 SQ. MI.

++++

```
*S BASIN 113: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=12  HYD NO=113.0  AREA=0.006265 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.389    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 = 1.8700
    AREA =      .002631 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   9.6681    CFS   UNIT VOLUME =    .9991       B =   354.67      P60 = 1.8700
    AREA =      .003634 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=12  CODE=1

                                PARTIAL HYDROGRAPH   113.00


    RUNOFF VOLUME =     1.29860 INCHES     =        .4339 ACRE-FEET
    PEAK DISCHARGE RATE =      13.04 CFS  AT   1.500 HOURS   BASIN AREA =   .0063 SQ. MI.


*S COMBINE BASINS 113 AND 112.2 TOGETHER
ADD HYD              ID=13  HYD NO=113.1  ID=21  ID=12
PRINT HYD            ID=13  CODE=1

                                PARTIAL HYDROGRAPH   113.10


    RUNOFF VOLUME =     1.22419 INCHES     =        .8050 ACRE-FEET
    PEAK DISCHARGE RATE =      23.49 CFS  AT   1.533 HOURS   BASIN AREA =   .0123 SQ. MI.


*S COMBINE BASINS 113 AND 109.2 TOGETHER
ADD HYD              ID=14  HYD NO=113.2  ID=13  ID=4
PRINT HYD            ID=14  CODE=1

                                PARTIAL HYDROGRAPH   113.20


    RUNOFF VOLUME =     1.26387 INCHES     =       1.7817 ACRE-FEET
    PEAK DISCHARGE RATE =      52.69 CFS  AT   1.533 HOURS   BASIN AREA =   .0264 SQ. MI.
```

```
*S BASIN 114: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=16  HYD NO=114.0  AREA=0.00737 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   12.221    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .003095 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   11.373    CFS   UNIT VOLUME =    .9993       B =   354.67      P60 = 1.8700
    AREA =      .004275 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=16  CODE=1

                                PARTIAL HYDROGRAPH   114.00


    RUNOFF VOLUME =     1.29860 INCHES     =        .5104 ACRE-FEET
    PEAK DISCHARGE RATE =      15.34 CFS  AT   1.500 HOURS   BASIN AREA =   .0074 SQ. MI.


*S COMBINE BASINS 110.1 AND 114 TOGETHER
ADD HYD              ID=17  HYD NO=114.1  ID=16  ID=6
PRINT HYD            ID=17  CODE=1

                                PARTIAL HYDROGRAPH   114.10


    RUNOFF VOLUME =     1.29857 INCHES     =       1.5146 ACRE-FEET
    PEAK DISCHARGE RATE =      45.17 CFS  AT   1.500 HOURS   BASIN AREA =   .0219 SQ. MI.


*S BASIN 115: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=18  HYD NO=115.0  AREA=0.00633 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.496    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 = 1.8700
    AREA =      .002659 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   9.7684    CFS   UNIT VOLUME =    .9991       B =   354.67      P60 = 1.8700
    AREA =      .003671 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
```

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=18 CODE=1

PARTIAL HYDROGRAPH 115.00

RUNOFF VOLUME = 1.29860 INCHES = .4384 ACRE-FEET
PEAK DISCHARGE RATE = 13.18 CFS AT 1.500 HOURS BASIN AREA = .0063 SQ. MI.

*S ** ROUTE BASIN 113.2 THROUGH 116
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 16 100.32
31.9 100.00 32.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=19 REACH NO=1 NO VS=1 L=550 FT
SLP=.0125

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1846
.071	.248	.33	.1163
.106	.558	.96	.0887
.141	.992	2.07	.0732
.176	1.549	3.75	.0631
.212	2.231	6.10	.0559
.247	3.037	9.20	.0504
.282	3.966	13.13	.0461
.317	5.020	17.98	.0427
.353	6.144	25.01	.0375
.388	7.269	33.05	.0336
.423	8.395	41.95	.0306
.458	9.521	51.67	.0282
.494	10.647	62.16	.0262
.529	11.774	73.40	.0245
.564	12.901	85.36	.0231
.599	14.029	98.01	.0219
.635	15.157	111.33	.0208
.670	16.285	125.31	.0199

```
ROUTE                ID=19 HYD NO=113.3 INFLOW ID=14 DT=0.0 HR
PRINT HYD            ID=19 CODE=1
```

PARTIAL HYDROGRAPH 113.30

```
RUNOFF VOLUME =      1.26391 INCHES      =       1.7817 ACRE-FEET
PEAK DISCHARGE RATE =      52.85 CFS  AT   1.533 HOURS   BASIN AREA =   .0264 SQ. MI.


*S BASIN 116: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=22  HYD NO=116.0  AREA=0.00526 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   8.7220    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.8700
AREA =       .002209 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =   8.1172    CFS   UNIT VOLUME =    .9988       B =   354.67      P60 = 1.8700
AREA =       .003051 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
PRINT HYD            ID=22  CODE=1

                                   PARTIAL HYDROGRAPH   116.00

    RUNOFF VOLUME =     1.29860 INCHES     =        .3643 ACRE-FEET
    PEAK DISCHARGE RATE =      10.95 CFS  AT   1.500 HOURS   BASIN AREA =   .0053 SQ. MI.


*S COMBINE BASINS 116 AND 113.3 TOGETHER
ADD HYD              ID=1  HYD NO=116.1  ID=19  ID=22
PRINT HYD            ID=1  CODE=1

                                   PARTIAL HYDROGRAPH   116.10

    RUNOFF VOLUME =     1.26965 INCHES     =       2.1460 ACRE-FEET
    PEAK DISCHARGE RATE =      63.45 CFS  AT   1.533 HOURS   BASIN AREA =   .0317 SQ. MI.


*S COMBINE BASINS 116.1 AND 115 TOGETHER
ADD HYD              ID=2  HYD NO=116.2  ID=1  ID=18
PRINT HYD            ID=2  CODE=1

                                   PARTIAL HYDROGRAPH   116.20

    RUNOFF VOLUME =     1.27446 INCHES     =       2.5844 ACRE-FEET
    PEAK DISCHARGE RATE =      76.21 CFS  AT   1.533 HOURS   BASIN AREA =   .0380 SQ. MI.


*S BASIN 117: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=3  HYD NO=117.0  AREA=0.00127 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   2.1059    CFS   UNIT VOLUME =    .9941       B =   526.28      P60 = 1.8700
    AREA =      .000533 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   1.9599    CFS   UNIT VOLUME =    .9937       B =   354.67      P60 = 1.8700
    AREA =      .000737 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=3  CODE=1
```

PARTIAL HYDROGRAPH 117.00

RUNOFF VOLUME = 1.29860 INCHES = .0880 ACRE-FEET
PEAK DISCHARGE RATE = 2.66 CFS AT 1.500 HOURS BASIN AREA = .0013 SQ. MI.

```
*S COMBINE BASINS 116.2 AND 117 TOGETHER
ADD HYD          ID=4  HYD NO=117.1  ID=2  ID=3
PRINT HYD        ID=4  CODE=1
```

PARTIAL HYDROGRAPH 117.10

RUNOFF VOLUME = 1.27523 INCHES = 2.6723 ACRE-FEET
PEAK DISCHARGE RATE = 78.78 CFS AT 1.533 HOURS BASIN AREA = .0393 SQ. MI.

```
*S ** ROUTE BASIN 114.1 THROUGH 118
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                     0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

```
COMPUTE TRAVEL TIME  ID=5 REACH NO=1 NO VS=1 L=550 FT
                     SLP=.0052

                          TRAVEL TIME TABLE
                                       REACH=  1.0

                          WATER       AVERAGE     FLOW        TRAVEL
                          DEPTH       AREA        RATE        TIME
                          FEET        SQ.FT.      CFS         HRS
                             .035        .062         .05       .1846
                             .071        .248         .33       .1163
                             .106        .558         .96       .0887
                             .141        .992        2.07       .0732
                             .176       1.549        3.75       .0631
                             .212       2.231        6.10       .0559
                             .247       3.037        9.20       .0504
                             .282       3.966       13.13       .0461
                             .317       5.020       17.98       .0427
                             .353       6.144       25.01       .0375
                             .388       7.269       33.05       .0336
                             .423       8.395       41.95       .0306
                             .458       9.521       51.67       .0282
                             .494      10.647       62.16       .0262
                             .529      11.774       73.40       .0245
                             .564      12.901       85.36       .0231
                             .599      14.029       98.01       .0219
                             .635      15.157      111.33       .0208
                             .670      16.285      125.31       .0199
ROUTE                ID=5 HYD NO=114.2 INFLOW ID=17 DT=0.0 HR
PRINT HYD            ID=5 CODE=1

                                  PARTIAL HYDROGRAPH   114.20


    RUNOFF VOLUME =     1.29859 INCHES     =       1.5147 ACRE-FEET
    PEAK DISCHARGE RATE =      45.29 CFS  AT   1.533 HOURS   BASIN AREA =   .0219 SQ. MI.


*S BASIN 118: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=6  HYD NO=118.0  AREA=0.00526 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   8.7220    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.8700
    AREA =      .002209 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =   8.1172    CFS   UNIT VOLUME =    .9988       B =   354.67      P60 = 1.8700
AREA =       .003051 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=6  CODE=1

                                PARTIAL HYDROGRAPH   118.00

RUNOFF VOLUME =     1.29860 INCHES     =        .3643 ACRE-FEET
PEAK DISCHARGE RATE =      10.95 CFS  AT   1.500 HOURS   BASIN AREA =   .0053 SQ. MI.


*S COMBINE BASINS 118 AND 114.2 TOGETHER
ADD HYD              ID=7  HYD NO=118.1  ID=6  ID=5
PRINT HYD            ID=7  CODE=1

                                PARTIAL HYDROGRAPH   118.10

RUNOFF VOLUME =     1.29857 INCHES     =       1.8789 ACRE-FEET
PEAK DISCHARGE RATE =      55.89 CFS  AT   1.533 HOURS   BASIN AREA =   .0271 SQ. MI.


*S BASIN 119: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=8  HYD NO=119.0  AREA=0.00186 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   3.0842    CFS   UNIT VOLUME =    .9955       B =   526.28      P60 = 1.8700
AREA =       .000781 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =   2.8703    CFS   UNIT VOLUME =    .9958       B =   354.67      P60 = 1.8700
AREA =       .001079 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=8  CODE=1

                                PARTIAL HYDROGRAPH   119.00

RUNOFF VOLUME =     1.29860 INCHES     =        .1288 ACRE-FEET
PEAK DISCHARGE RATE =       3.88 CFS  AT   1.500 HOURS   BASIN AREA =   .0019 SQ. MI.
```

```
*S COMBINE BASINS 118.1 AND 119 TOGETHER
ADD HYD              ID=9  HYD NO=118.2  ID=8  ID=7
PRINT HYD            ID=9  CODE=1

                                PARTIAL HYDROGRAPH   118.20


    RUNOFF VOLUME =      1.29856 INCHES      =        2.0077 ACRE-FEET
    PEAK DISCHARGE RATE =       59.65 CFS  AT   1.533 HOURS   BASIN AREA =   .0290 SQ. MI.


*S ** ROUTE BASIN 107.2 THROUGH 120
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                     0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER       FLOW        FLOW        TOP
                                  SURFACE      AREA        RATE        WIDTH
                                   ELEV        SQ FT       CFS         FT
                                  100.00        .00         .00         .00
                                  100.04        .06         .05        3.51
                                  100.07        .25         .33        7.03
                                  100.11        .56         .96       10.54
                                  100.14        .99        2.07       14.06
                                  100.18       1.55        3.75       17.57
                                  100.21       2.23        6.10       21.09
                                  100.25       3.04        9.20       24.60
                                  100.28       3.97       13.13       28.12
                                  100.32       5.02       17.98       31.63
                                  100.35       6.14       25.01       31.91
                                  100.39       7.27       33.05       31.92
                                  100.42       8.40       41.95       31.93
                                  100.46       9.52       51.67       31.94
                                  100.49      10.65       62.16       31.95
                                  100.53      11.77       73.40       31.96
                                  100.56      12.90       85.36       31.97
                                  100.60      14.03       98.01       31.98
                                  100.63      15.16      111.33       31.99
                                  100.67      16.28      125.31       32.00
COMPUTE TRAVEL TIME  ID=10 REACH NO=1 NO VS=1 L=250 FT
                     SLP=.005
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0839
.071	.248	.33	.0528
.106	.558	.96	.0403
.141	.992	2.07	.0333
.176	1.549	3.75	.0287
.212	2.231	6.10	.0254
.247	3.037	9.20	.0229
.282	3.966	13.13	.0210
.317	5.020	17.98	.0194
.353	6.144	25.01	.0171
.388	7.269	33.05	.0153
.423	8.395	41.95	.0139
.458	9.521	51.67	.0128
.494	10.647	62.16	.0119
.529	11.774	73.40	.0111
.564	12.901	85.36	.0105
.599	14.029	98.01	.0099
.635	15.157	111.33	.0095
.670	16.285	125.31	.0090

```
ROUTE                ID=10 HYD NO=107.3 INFLOW ID=20 DT=0.0 HR
PRINT HYD            ID=10 CODE=1
```

PARTIAL HYDROGRAPH 107.30

```
RUNOFF VOLUME =      1.29858 INCHES     =        .8360 ACRE-FEET
PEAK DISCHARGE RATE =      24.80 CFS  AT   1.533 HOURS   BASIN AREA =   .0121 SQ. MI.


*S BASIN 120: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=11  HYD NO=120.0  AREA=0.00444 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   7.3623    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
AREA =      .001865 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =   6.8518    CFS   UNIT VOLUME =    .9984       B =   354.67      P60 = 1.8700
AREA =      .002575 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
PRINT HYD            ID=11  CODE=1

                                   PARTIAL HYDROGRAPH   120.00

    RUNOFF VOLUME =     1.29860 INCHES     =        .3075 ACRE-FEET
    PEAK DISCHARGE RATE =       9.25 CFS  AT   1.500 HOURS   BASIN AREA =   .0044 SQ. MI.


*S COMBINE BASINS 120 AND 107.2 TOGETHER
ADD HYD              ID=12  HYD NO=120.1  ID=11  ID=10
PRINT HYD            ID=12  CODE=1

                                   PARTIAL HYDROGRAPH   120.10

    RUNOFF VOLUME =     1.29854 INCHES     =       1.1435 ACRE-FEET
    PEAK DISCHARGE RATE =      33.75 CFS  AT   1.533 HOURS   BASIN AREA =   .0165 SQ. MI.


*S ** ROUTE BASIN 120.1 THROUGH 121
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                     0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98

```
                                        100.63       15.16       111.33       31.99
                                        100.67       16.28       125.31       32.00
COMPUTE TRAVEL TIME  ID=13 REACH NO=1 NO VS=1 L=325 FT
                     SLP=.005

                              TRAVEL TIME TABLE
                                          REACH=  1.0

                              WATER       AVERAGE     FLOW        TRAVEL
                              DEPTH       AREA        RATE        TIME
                              FEET        SQ.FT.      CFS         HRS
                                 .035        .062         .05       .1091
                                 .071        .248         .33       .0687
                                 .106        .558         .96       .0524
                                 .141        .992        2.07       .0433
                                 .176       1.549        3.75       .0373
                                 .212       2.231        6.10       .0330
                                 .247       3.037        9.20       .0298
                                 .282       3.966       13.13       .0273
                                 .317       5.020       17.98       .0252
                                 .353       6.144       25.01       .0222
                                 .388       7.269       33.05       .0199
                                 .423       8.395       41.95       .0181
                                 .458       9.521       51.67       .0166
                                 .494      10.647       62.16       .0155
                                 .529      11.774       73.40       .0145
                                 .564      12.901       85.36       .0136
                                 .599      14.029       98.01       .0129
                                 .635      15.157      111.33       .0123
                                 .670      16.285      125.31       .0117
ROUTE                ID=13 HYD NO=120.2 INFLOW ID=12 DT=0.0 HR
PRINT HYD            ID=13 CODE=1

                                   PARTIAL HYDROGRAPH   120.20


    RUNOFF VOLUME =     1.29857 INCHES     =       1.1435 ACRE-FEET
    PEAK DISCHARGE RATE =      33.52 CFS  AT   1.533 HOURS   BASIN AREA =   .0165 SQ. MI.


*S BASIN 121: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=14  HYD NO=121.0  AREA=0.0022 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   3.6480    CFS   UNIT VOLUME =    .9961       B =   526.28      P60 = 1.8700
    AREA =      .000924 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =   3.3950    CFS   UNIT VOLUME =    .9966       B =   354.67      P60 = 1.8700
AREA =      .001276 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=14  CODE=1

                                PARTIAL HYDROGRAPH   121.00


RUNOFF VOLUME =     1.29860 INCHES     =        .1524 ACRE-FEET
PEAK DISCHARGE RATE =       4.59 CFS  AT   1.500 HOURS   BASIN AREA =   .0022 SQ. MI.


*S COMBINE BASINS 121 AND 120.2 TOGETHER
ADD HYD              ID=15  HYD NO=121.1  ID=14  ID=13
PRINT HYD            ID=15  CODE=1

                                PARTIAL HYDROGRAPH   121.10


RUNOFF VOLUME =     1.29853 INCHES     =       1.2958 ACRE-FEET
PEAK DISCHARGE RATE =      37.97 CFS  AT   1.533 HOURS   BASIN AREA =   .0187 SQ. MI.


*S ** ROUTE BASIN 104.1 THROUGH 122
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                     0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93

100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

```
COMPUTE TRAVEL TIME  ID=23 REACH NO=1 NO VS=1 L=480 FT
                     SLP=.0184
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1611
.071	.248	.33	.1015
.106	.558	.96	.0774
.141	.992	2.07	.0639
.176	1.549	3.75	.0551
.212	2.231	6.10	.0488
.247	3.037	9.20	.0440
.282	3.966	13.13	.0403
.317	5.020	17.98	.0372
.353	6.144	25.01	.0328
.388	7.269	33.05	.0293
.423	8.395	41.95	.0267
.458	9.521	51.67	.0246
.494	10.647	62.16	.0228
.529	11.774	73.40	.0214
.564	12.901	85.36	.0202
.599	14.029	98.01	.0191
.635	15.157	111.33	.0182
.670	16.285	125.31	.0173

```
ROUTE                ID=23 HYD NO=104.2 INFLOW ID=30 DT=0.0 HR
PRINT HYD            ID=23 CODE=1
```

PARTIAL HYDROGRAPH 104.20

RUNOFF VOLUME = 1.29857 INCHES = 2.0046 ACRE-FEET
PEAK DISCHARGE RATE = 58.43 CFS AT 1.533 HOURS BASIN AREA = .0289 SQ. MI.

```
*S BASIN 122: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=16  HYD NO=122.0  AREA=0.00784 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1
```

```
K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   13.000    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.8700
AREA =       .003293 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =   12.099    CFS   UNIT VOLUME =    .9993       B =   354.67      P60 = 1.8700
AREA =       .004547 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=16  CODE=1

                                PARTIAL HYDROGRAPH   122.00


RUNOFF VOLUME =     1.29860 INCHES      =        .5430 ACRE-FEET
PEAK DISCHARGE RATE =      16.32 CFS  AT   1.500 HOURS   BASIN AREA =   .0078 SQ. MI.


*S COMBINE BASINS 122 AND 121.1 TOGETHER
ADD HYD              ID=17  HYD NO=122.1  ID=16  ID=15
PRINT HYD            ID=17  CODE=1

                                PARTIAL HYDROGRAPH   122.10


RUNOFF VOLUME =     1.29854 INCHES      =       1.8388 ACRE-FEET
PEAK DISCHARGE RATE =      53.76 CFS  AT   1.533 HOURS   BASIN AREA =   .0266 SQ. MI.
```

? ok

```
*S COMBINE BASINS 122.1 AND 118.2 TOGETHER
ADD HYD              ID=18  HYD NO=122.2  ID=17  ID=9
PRINT HYD            ID=18  CODE=1

                                PARTIAL HYDROGRAPH   122.20


RUNOFF VOLUME =     1.29855 INCHES      =       3.8465 ACRE-FEET
PEAK DISCHARGE RATE =     113.41 CFS  AT   1.533 HOURS   BASIN AREA =   .0555 SQ. MI.


*S COMBINE BASINS 122.2 AND 117.1 TOGETHER
ADD HYD              ID=19  HYD NO=122.3  ID=18  ID=4
PRINT HYD            ID=19  CODE=1

                                PARTIAL HYDROGRAPH   122.30
```

```
    RUNOFF VOLUME =      1.28889 INCHES      =        6.5188 ACRE-FEET
    PEAK DISCHARGE RATE =      192.18 CFS  AT   1.533 HOURS   BASIN AREA =   .0948 SQ. MI.


*S COMBINE BASINS 122.3 AND 104.2 TOGETHER
ADD HYD              ID=20  HYD NO=122.4  ID=19  ID=23
PRINT HYD            ID=20  CODE=1

                                PARTIAL HYDROGRAPH   122.40


    RUNOFF VOLUME =      1.29115 INCHES      =        8.5235 ACRE-FEET
    PEAK DISCHARGE RATE =      250.61 CFS  AT   1.533 HOURS   BASIN AREA =   .1238 SQ. MI.


*S OFFSITE BASINS:  UNSER BLVD
*S BASIN 201.1: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)
COMPUTE NM HYD       ID=1  HYD NO=201.1  AREA=0.00073 SQ MI
                     PER A=0  PER B=20 PER C=20 PER D=60
                     TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   1.7292    CFS   UNIT VOLUME =    .9933       B =   526.28      P60 = 1.8700
    AREA =       .000438 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   .77692    CFS   UNIT VOLUME =    .9831       B =   354.67      P60 = 1.8700
    AREA =       .000292 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1  CODE=1

                                PARTIAL HYDROGRAPH   201.10


    RUNOFF VOLUME =      1.50556 INCHES      =         .0586 ACRE-FEET
    PEAK DISCHARGE RATE =        1.70 CFS  AT   1.500 HOURS   BASIN AREA =   .0007 SQ. MI.


*S BASIN 201.2: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)
COMPUTE NM HYD       ID=2  HYD NO=201.2  AREA=0.002814 SQ MI
                     PER A=0  PER B=20  PER C=20  PER D=60
                     TP=-0.1333 HR  MASS RAIN=-1
```

```
K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   6.6659    CFS   UNIT VOLUME =    .9976       B =   526.28      P60 = 1.8700
AREA =       .001688 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =   2.9949    CFS   UNIT VOLUME =    .9958       B =   354.67      P60 = 1.8700
AREA =       .001126 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=2  CODE=1

                                PARTIAL HYDROGRAPH   201.20


RUNOFF VOLUME =     1.50556 INCHES     =        .2260 ACRE-FEET
PEAK DISCHARGE RATE =       6.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0028 SQ. MI.


*S BASIN 201.3: OFFSITE: UNSER BLVD. MEDIAN AREA
COMPUTE NM HYD      ID=3  HYD NO=201.3  AREA=0.002147 SQ MI
                    PER A=0  PER B=20  PER C=20  PER D=60
                    TP=-0.1333 HR  MASS RAIN=-1

K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   5.0859    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
AREA =       .001288 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =   2.2850    CFS   UNIT VOLUME =    .9948       B =   354.67      P60 = 1.8700
AREA =       .000859 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=3  CODE=1

                                PARTIAL HYDROGRAPH   201.30


RUNOFF VOLUME =     1.50556 INCHES     =        .1724 ACRE-FEET
PEAK DISCHARGE RATE =       4.96 CFS  AT   1.500 HOURS   BASIN AREA =   .0021 SQ. MI.


FINISH

NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 10:37:34
```

APPENDIX B

UNSER BLVD. - 10-YEAR DRY LANE STUDY

SUBJECT: **Unser Blvd. Dry Lane Analysis**

CRITERIA: 10-year Storm (AHYMO 1994)

SOLUTION: Storm drains shall be situated on the est side of Unser Blvd. for that portion of roadway from Freshwater Road to the end of Unit One Subdivision. A stub will be provided to collect storm water from Tract E, Albuquerque South Unit 1 when it is developed. Runoff onto the west and east lanes shall be based upon each lane having a contributing cross-section width of 50 feet. The 56-foot wide median shall be designed as having temporary storm water retention incorporated into the design (see attached exhibit). Storm drain inlet location shall allow for one "dry" lane in the event of the 10-year storm. The temporary median retention improvements may be abandoned when Unser Blvd. is expanded to six (6) lanes and the median is reconstructed with permanent improvements such as a paved surface and/or median landscaping. The "dry" lane is achieved on the median lane and the increase in storm water flows is carried by the original 25-foot wide driving lanes.

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UNSER BLVD. DRY LANE STUDY

CRITERIA : 10 YR STORM
AHYMO (1994)

METHODOLOGY : USING CHART 3 AND 4 (ATTACHED)
"FLOW IN TRIANGULAR SECTIONS"

$Q = Q_s / (1 - E_o)$

WHERE $E_o = 0.44$ (CHART 4)

AND $Q_s = 2.6$ CFS

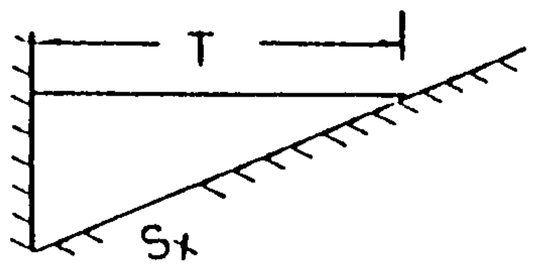
$\therefore Q = 2.6/(1 - 0.44) = 4.64$ cfs = CURB LANE STORM WATER CARRYING CAPACITY

DATA : AREA WITHIN BASIN 120.2
TOTAL LENGTH : 1650 FT
WIDTH (WEST R/W TO MED. CURB) = 50'

FROM AHYMO : $Q_{100} = 6.5$ cfs
$Q_{10} = 3.9$ cfs < 4.64 cfs $\therefore$ O.K.
$d_{10} = 0.33$

Q_{10} CAPTURED FROM INLET = 1.9 cfs

Q_{10} bypass = 3.9 - 1.9 = 2.0 cfs



$$Q = \frac{0.56}{n} S_x^{1.67} S^{0.5} T^{2.67}$$

EXAMPLE: GIVEN:

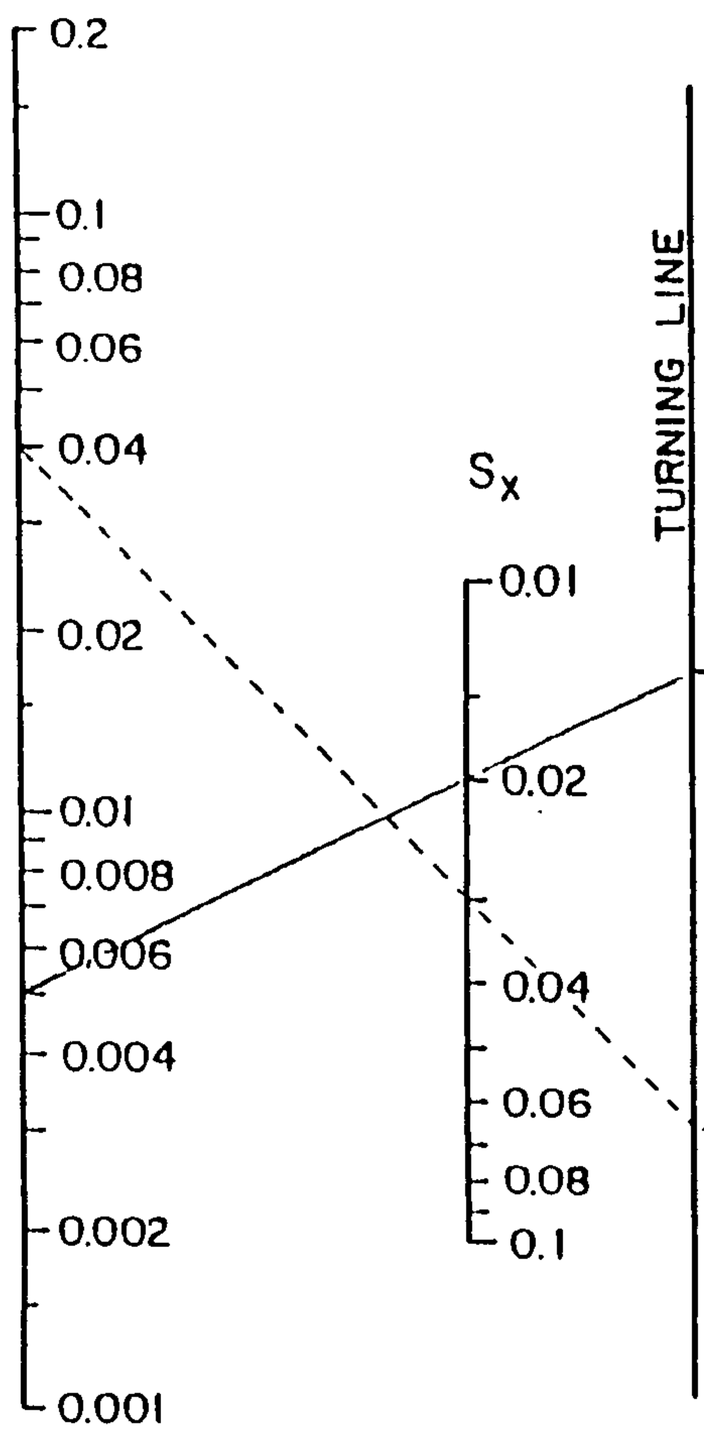
$n = 0.016$; $S_x = 0.03$

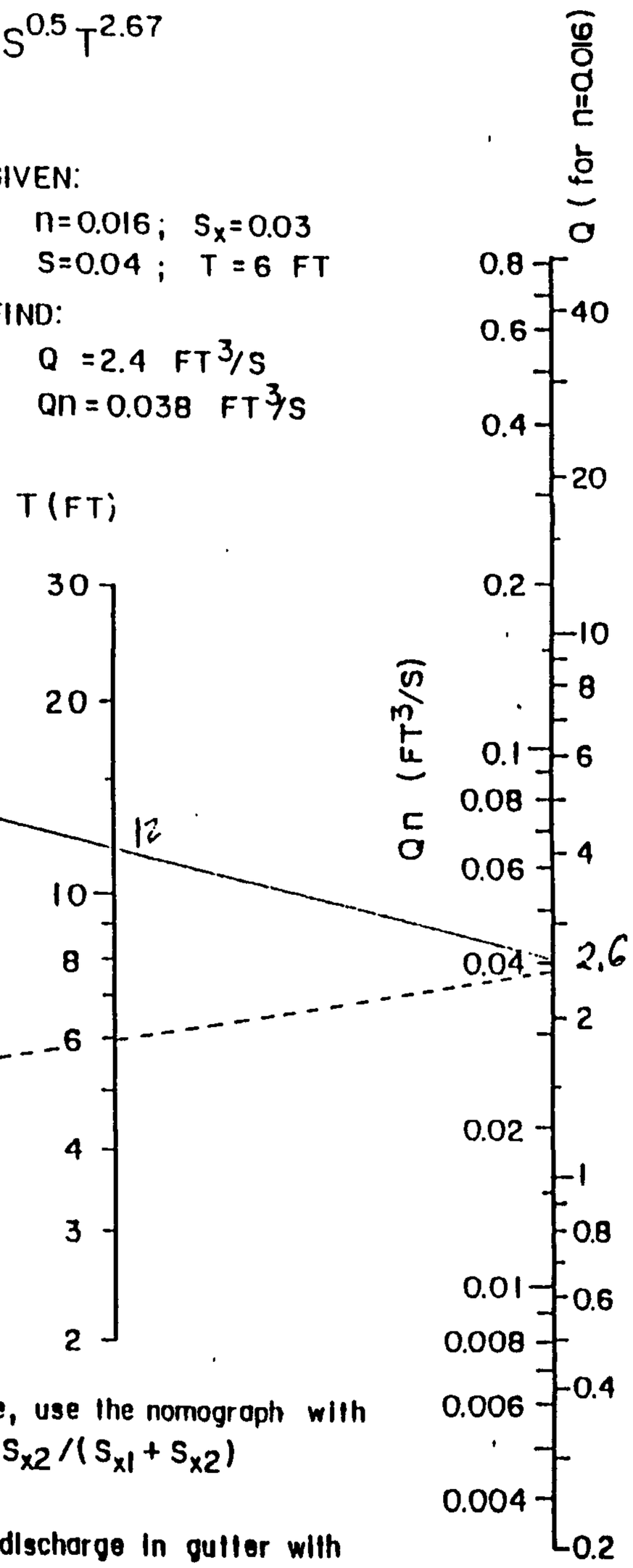
$S = 0.04$; $T = 6$ FT

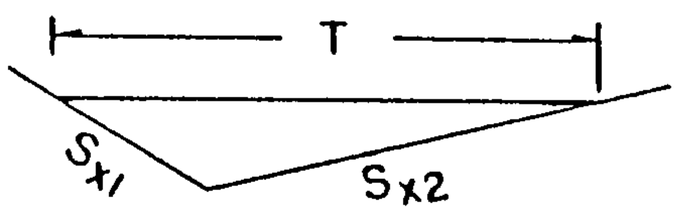
FIND:

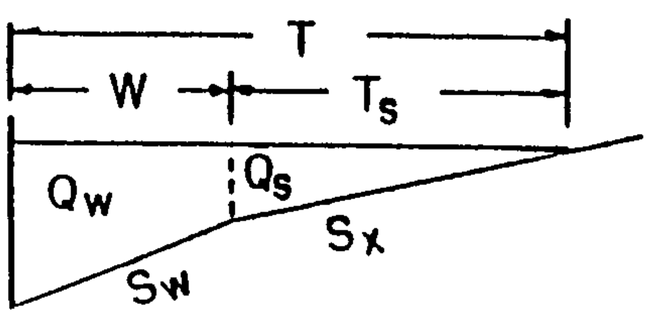
$Q = 2.4$ FT^3/S

$Qn = 0.038$ FT^3/S









1) For V-Shape, use the nomograph with $S_x = S_{x1} S_{x2} / (S_{x1} + S_{x2})$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use CHART 4 to find E_o. The total discharge is $Q = Q_s / (1 - E_o)$, and $Q_w = Q - Q_s$.

CHART 3. Flow in triangular gutter sections.

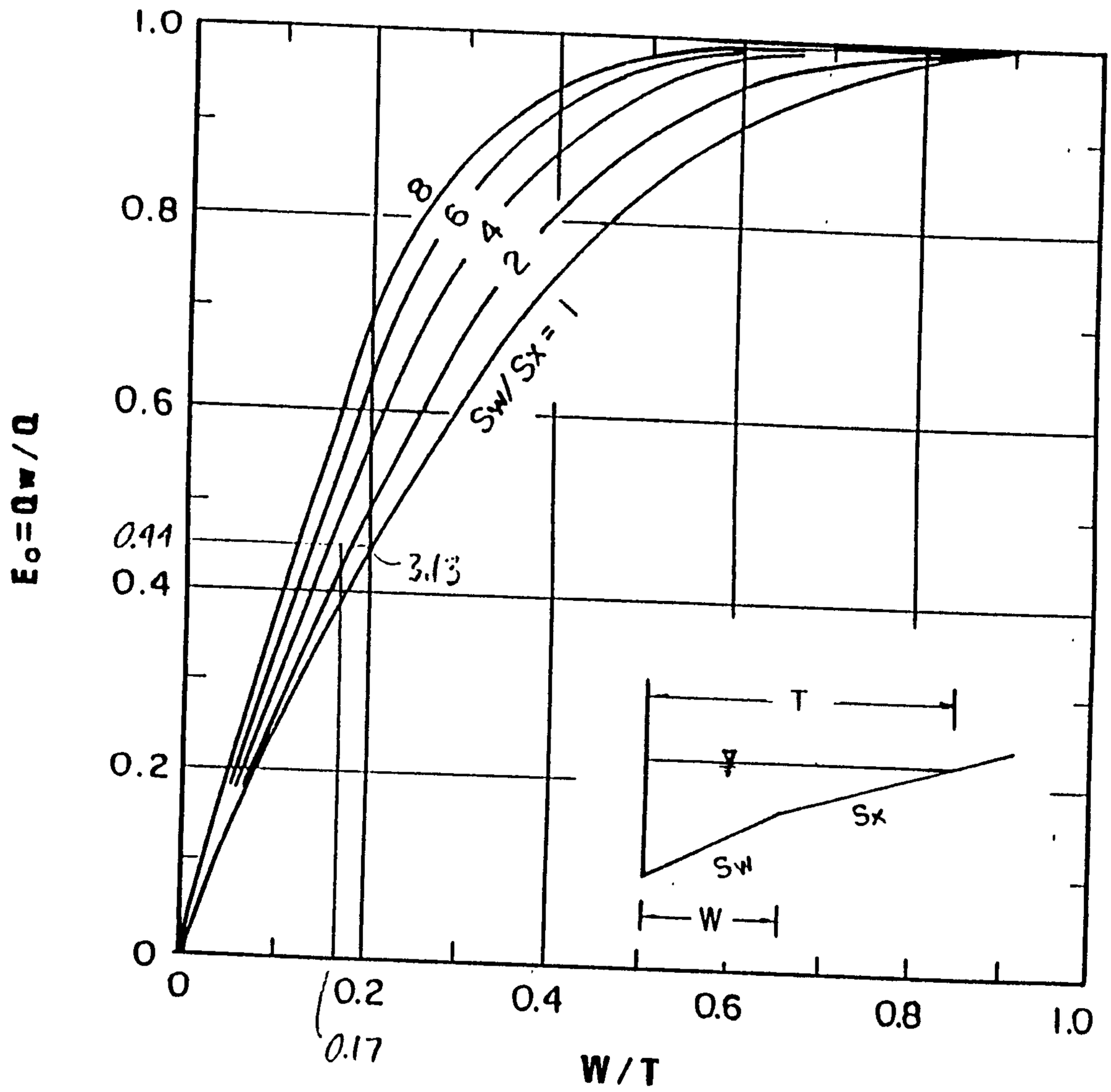
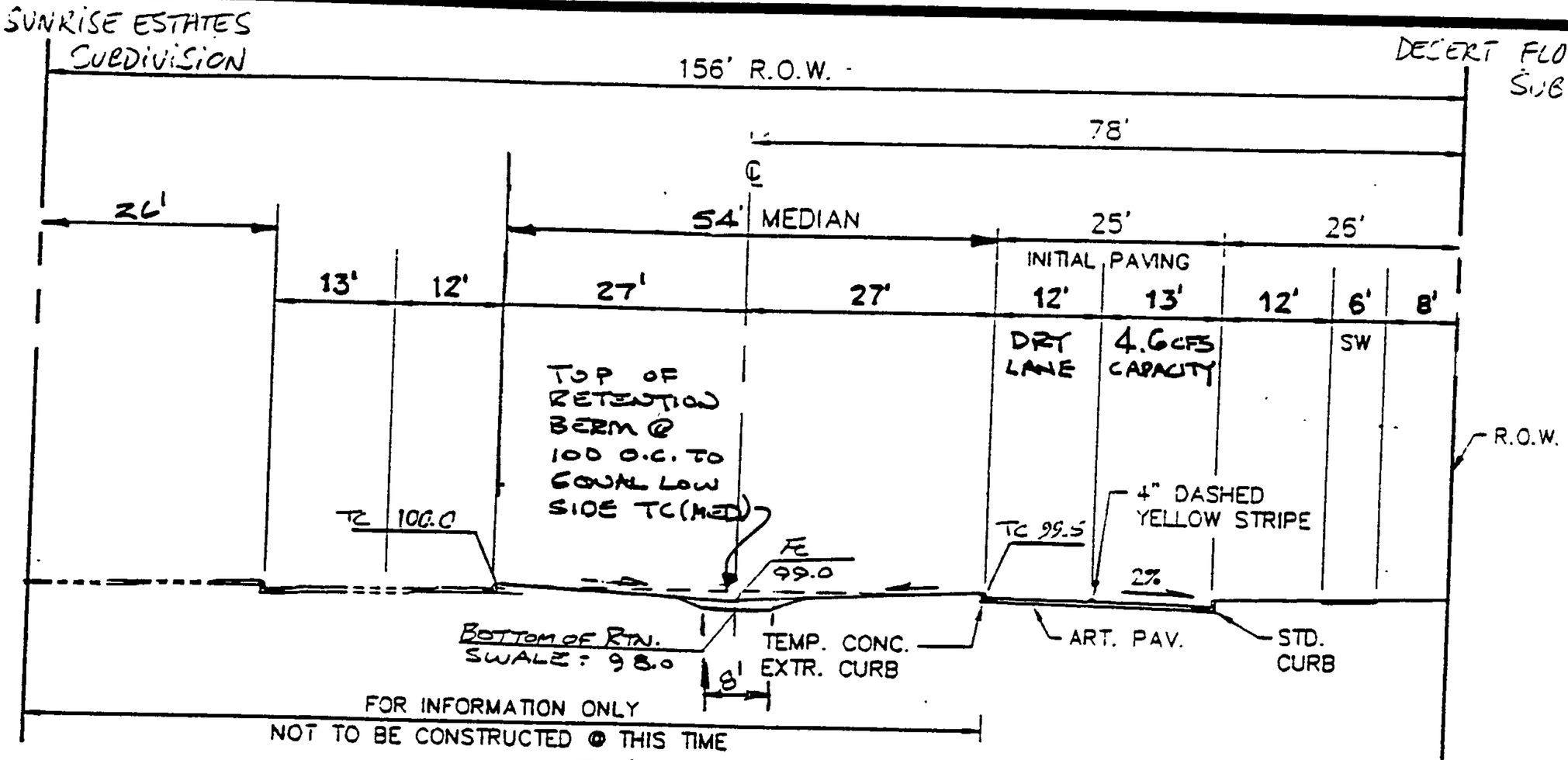


CHART 4. Ratio of frontal flow to total gutter flow.



INITIAL PAVING SECTION

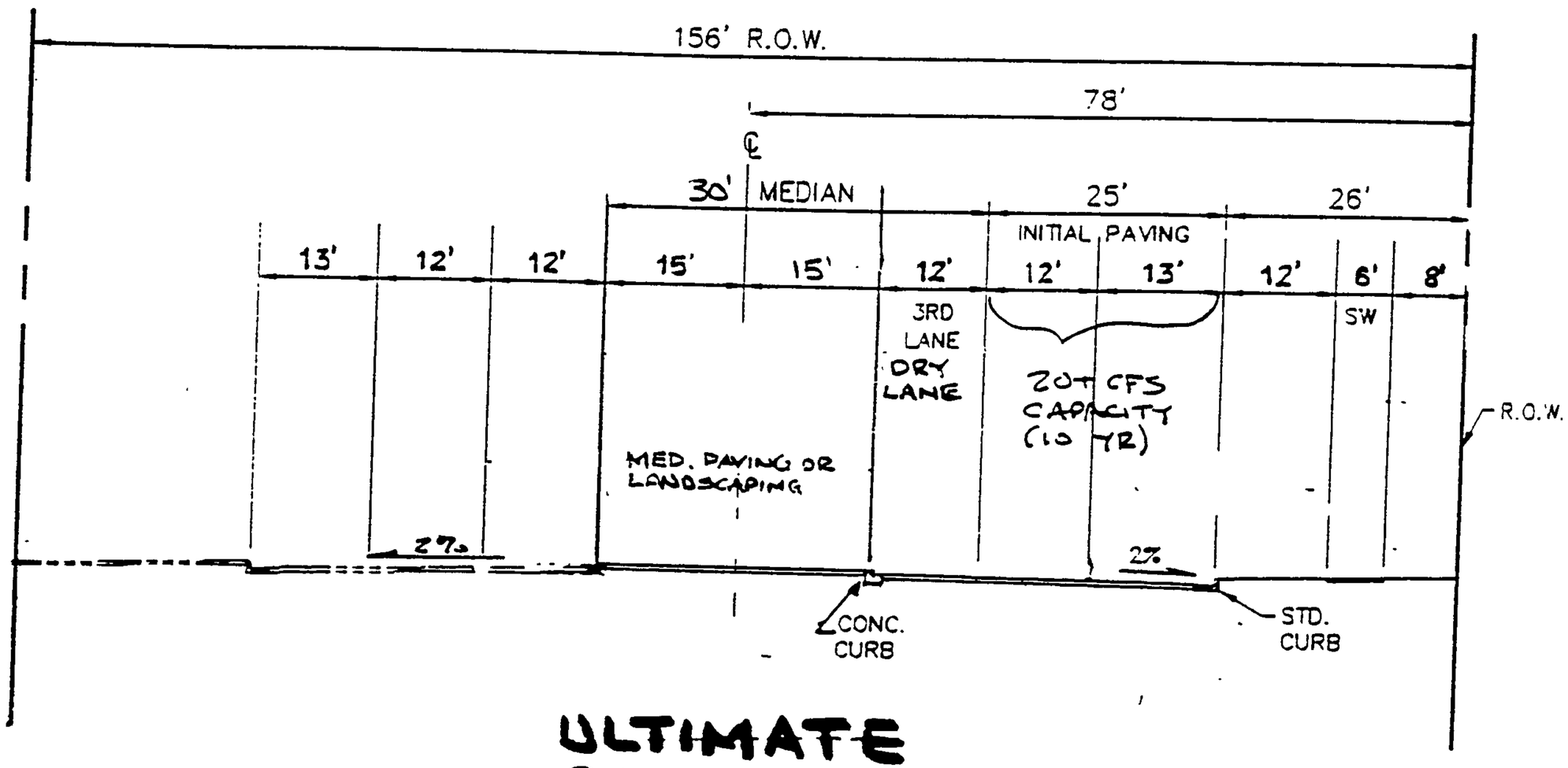
UNSER BLVD

SCALE: 1"=20'

ISAACSON & ARFMAN, P.A.

SUBJECT UNSER BLVD. JOB NO.

BY FCA DATE 6/97 SHEET NO. OF



ULTIMATE PAVING SECTION

UNSER BLVD

SCALE: 1"=20'

ISAACSON & ARFMAN, P.A.

SUBJECT _____ JOB NO. ____

BY _____ DATE _____ SHEET NO. ____ OF ____

APPENDIX C

DISCHARGE TO THE AMOLE DEL NORTE CHANNEL
(REF. ARENAL/UNSER DRINAGE MANAGEMENT PLAN)

This section contains pertinent information taken from the Arenal/Unser Drainage Management Plan of June 1997 regarding controlled flows of the site into the Amole del Norte Diversion Channel. Below is a Summary of the contents in the report with emphasis on how it applies to the Desert Flower Master Report. The report starts with the vicinity map of the plan site. Followed is the introduction, the plan sponsors and participants, and the proposed drainage solution, to give a broad view of the Plan report.

The appendix section contains the original subbasin map taken from Boyle Engineering Report. Subbasins 32D-36D and 38D were converted to Subbasins 100-505 in the Arenal/Unser Drainage Management Plan. In this report, Desert Flower Master Drainage Report, Subbasin 408 is broken down into Subbasins 408A, 408B and 408C. The storm water generated is the same before and after Subbasin 408 was adjusted.

Table 1 shows the original hydrograph data of the Amole del Norte Diversion Channel by Boyle Engineering. Table 2 shows the new hydrograph data of the channel. Followed is a graph from the two tables of the discharge into the channel at different times. The graph shows that the peak discharge of the new hydrograph is lower than the previous hydrograph's peak discharge; therefore, the allowed controlled discharges into the channel do not exceed the capacity the channel was built for. Concluding this section is the hydrograph computation of Basin 408.

The intent of this section is to give a general view of the Unser/Arenal Drainage report and how it applies to the Desert Flower Master Drainage Report. Therefore, it contains only relevant data. Referencing to the original Arenal/Unser Drainage Management Plan should be made for a full understanding of the report.

TABLE OF CONTENTS

Vicinity Map

I. Introduction

II. Plan Sponsors and Participants

III. Proposed Drainage Management Plan Solution

IV. The Plan

Appendices

BEC Subbasin Maps

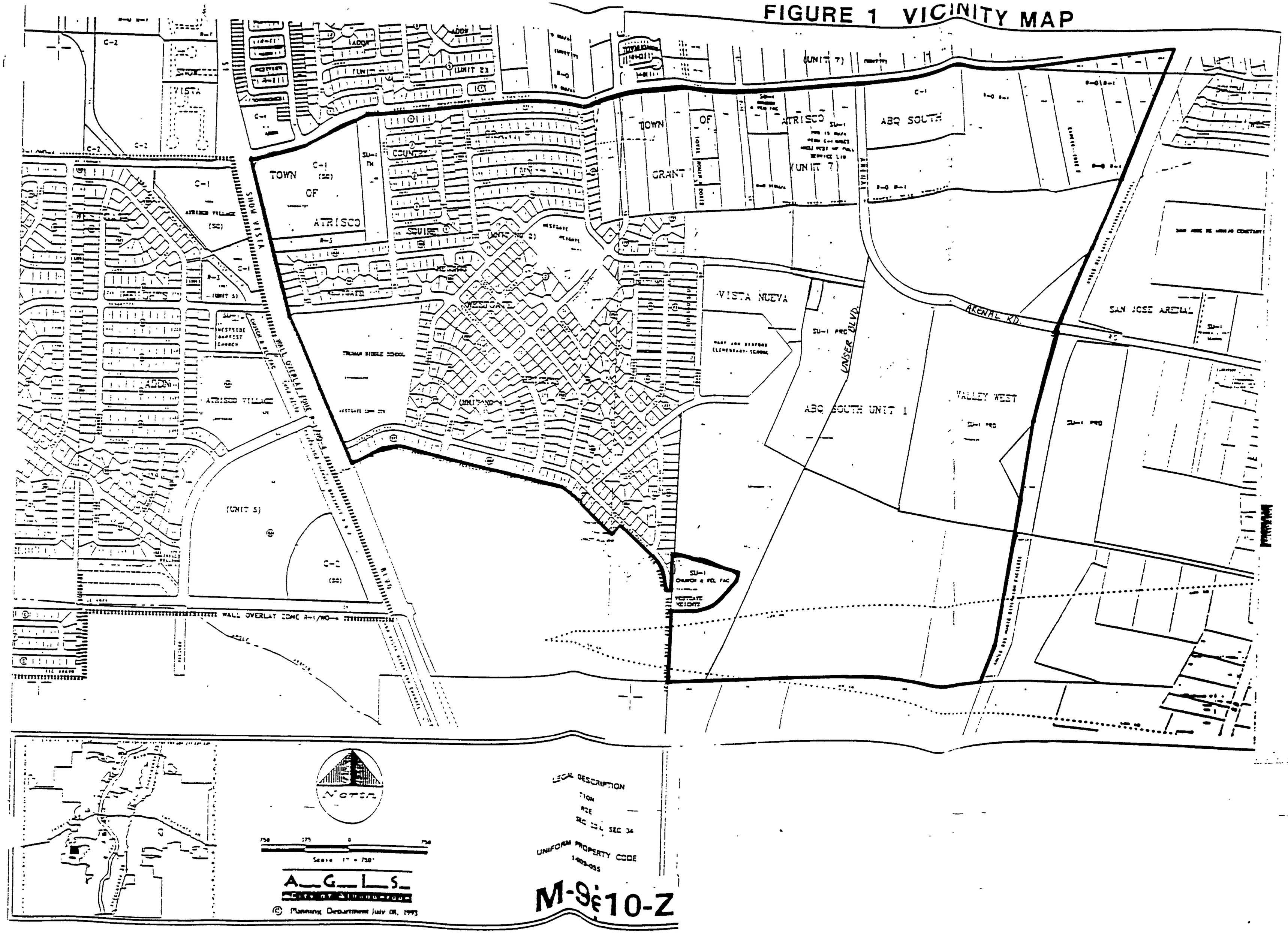
Table 1: Previous Hydrograph Datas of the Amole del Norte Channel

Table 2: Revised Hydrograph Datas of the Amole del Norte Channel

Hydrograph of the Amole del Norte Channel

Hydrograph Computational Datas

FIGURE 1 VICINITY MAP



I. INTRODUCTION

The Arenal/Unser Drainage Management Plan has evolved from the original master drainage study of the area, prepared in July 1994 and updated in July 1996. That plan defined and analyzed the storm water runoff situation for a large portion of land south of Sage Road SW between the Snow Vista Diversion Channel at the westerly boundary unit and the Amole del Norte Diversion Channel defining the easterly boundary of the study.

The previous study defined the existing drainage basins and quantified the storm water runoff characteristics for the 100-year frequency/6-hour duration storm. The storm water rates and volumes calculated in the 1996 study are used as the basis of developing the Drainage Management Plan presented in this report. The AHYMO models have been revised and expanded to reflect the proposed developable areas. The summary files and output files from these models are found in Appendix C of this report.

It is the intent of this plan to present a viable solution to the basin storm water runoff problem currently inhibiting the development potential of the area. Currently, those storm waters generated by the older Westgate Heights residential neighborhood are identified as a floodway by the latest edition of the F.E.M.A. floodway maps. The ultimate solution of providing those storm drainage facilities and eliminating the floodplain is contingent upon the joint efforts of both the public and private sectors. Their role shall be clearly delineated by the following plan.

II. PLAN SPONSORS AND PARTICIPANTS

The following passive land owner and active developers along with the City of Albuquerque are responsible for the funding and construction of the public infrastructure required for the completion of the plan.

A. **Albuquerque South:** A passive land holding general partnership owning most of the undeveloped land in the contributing drainage basins.

B. **Presley Homes, Inc.:** Developers of the Summerfield Subdivision (Sunrise Estates, Units One, Two, and Three). The initial development of Unit One (93 R-1 lots) required the construction of a 60-66" diameter storm drain to convey those storm waters generated for the Westgate Heights development immediately to the west and discharging its storm water via Sapphire Street.

The second unit of Presley's development will construct the Kimela Road and Unser Blvd. storm drains and will be 100% funded by the developer.

C. **Longford Homes of New Mexico:** The Rolling Hills Subdivision will ultimately consist of approximately 336 single family residential lots divided into five phases with the Unit Two project currently under

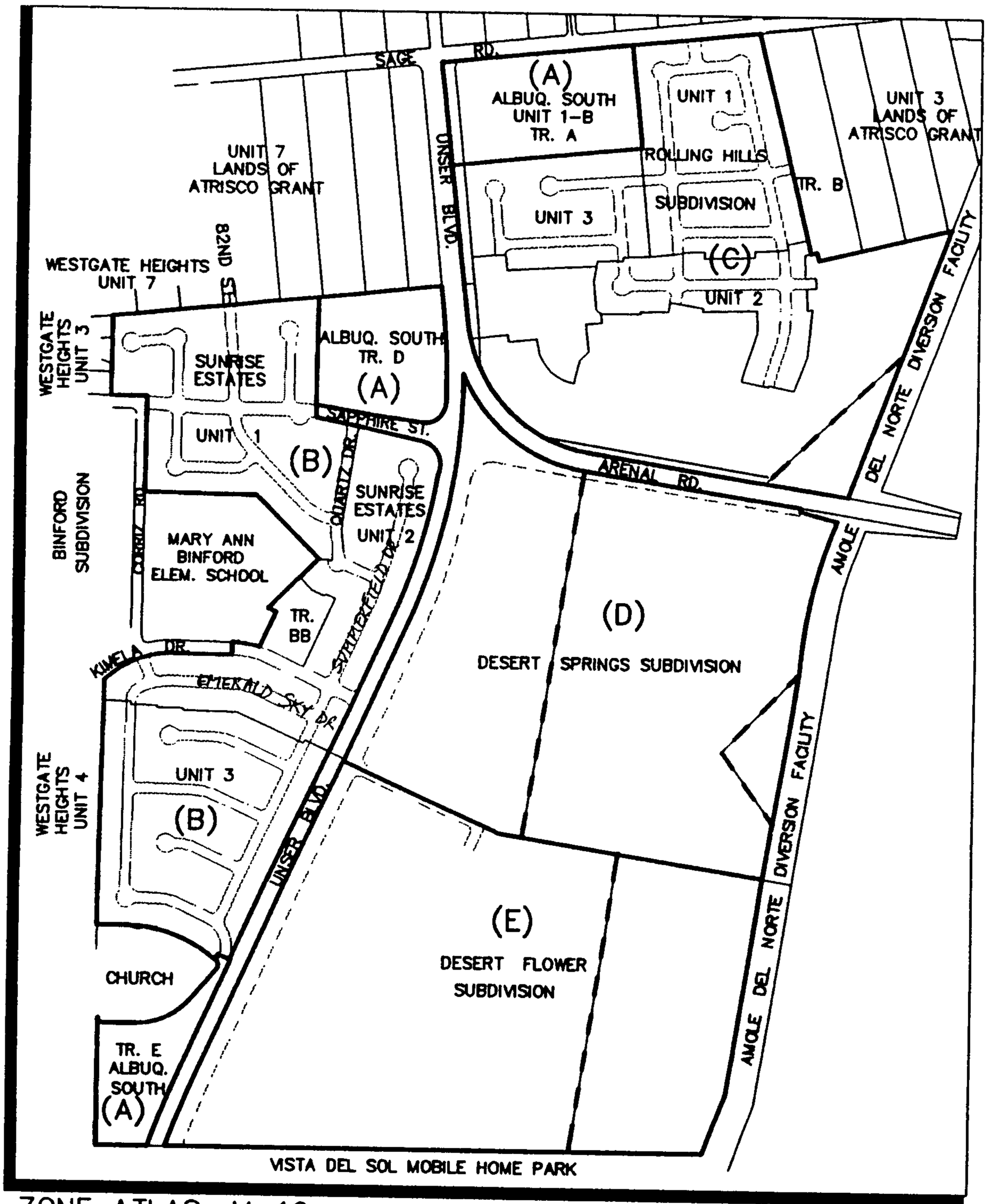
construction. The development is situated between Sage Road and Arenal Road just east of Unser Blvd. SW. Units Three and Four are at various stages in the platting process and are scheduled for construction in early 1997.

The overall development is covered by the Rolling Hills Drainage Management Plan on file at City of Albuquerque Hydrology Division. This plan proposes to discharge the developed storm waters directly to the Amole del Norte Channel at two locations. The project will construct two storm drain lines in the east-west streets and construction of all phases shall be independent of the City funded storm drain situated in Arenal Road.

D. **Builders Investment Co. of NM, Ltd.**: This developer is under contract to purchase 77 acres along the south right-of-way of Arenal Road between Unser Blvd. and the Amole del Norte Diversion Channel. The single family subdivisions (RLT zoning) is projected to be developed in four units with the first phase being a 102 lot subdivision east of Unser Blvd.

The approval and development of Unit One will require the dedication of approximately 3.8 acres at the southeast corner of Unser Blvd. and Arenal Road SW. This area will be utilized as a detention facility for the Unser/Sapphire storm drain system. The phased development

PLAN SPONSORS OWNERSHP MAP



ZONE ATLAS: M-10

SCALE: 1"=750'±

(A) ALBUQUERQUE SOUTH GENERAL PARTNERSHIP
(B) PRESLEY HOMES
(C) LONGFORD HOMES OF NEW MEXICO
(D) BUILDERS INVESTMENT COMPANY OF NEW MEXICO, LTD.
(E) CURB, INC.

9030WNMP.DWGems 06/18/97

of this first, temporary/ultimately, permanent detention pond shall be discussed further in the body of this report.

E. **Curb, Inc.:** Curb, Inc. has purchased a portion of Tract F, Albuquerque South, Unit One, consisting of 60.2 acres. A majority of Tract F is protected from upstream drainage by the proposed improvements to Unser Blvd. bordering on the west. The single family subdivision (proposed R-LT zoning) is projected to be developed in four units. The first phase will have an 84 lot subdivision and lies east of Unser Blvd.

III. PROPOSED DRAINAGE MANAGEMENT PLAN SOLUTION

The plan participants identified above have all purchased their parcels from the Albuquerque South General Partnership. The storm water runoff from each development will ultimately be accepted by the Amole del Norte Diversion Channel. The channel was designed using the older hydrology methods and is now under study by Leedshill-Herkenhoff Engineers under contract to AMAFCA to determine if and how much the channel is undersized with respect to handling the fully developed storm water runoff under current hydrology criteria.

It is the intent of this plan to demonstrate that a single regional detention facility at the southeast quadrant of Unser Blvd. and Arenal Road will provide the necessary detention of storm waters and a reduction in the storm water rate of flow into the Amole del Norte Diversion Channel to the same discharge rate the channel was originally designed by Boyle Engineering Corp (BEC) in 1985. The reduced rate shall apply to the parcels identified as the plan participants and will encompass eight to nine connection points to the channel.

The BEC report titled "Investigation Phase Report for the Re-Evaluation Study of the Amole del Norte Storm Diversion Facility" dated June 1984 was the design basis for the construction of the Amole del Norte Channel. The report was a hydrological analysis for the Amole del Norte Drainage basin using the SCS curve number method which was the accepted rationale at the time. The subbasin boundaries determined in the BEC report correspond with the boundaries used in our analysis. BEC's subbasins 32-36 and 38 were replaced with subbasins 100-505 in this report. It was determined that the best way to derive a discharge rate to the Amole del Norte Channel was to reduce the flow rate/unit area (cfs/ac) from the current analysis to that of the BEC study. The detention pond will then be designed such that it will be sufficiently large enough to detain the discharge from the upstream areas to the cfs/ac that the channel was originally designed for in 1984. The AHYMO model in Appendix C includes a reservoir route to preliminarily design the detention pond. A more complete design of the pond will be performed when construction of the pond becomes necessary for further development to proceed.

Analysis of the side discharges to the channel were needed to determine how much runoff could discharge into the channel. BEC report shows that subbasins 32-35 make a side discharge to the channel at Arenal Road, subbasin 36 makes a side discharge 1700' south of Arenal Road, and subbasin 38 makes a side discharge 3000' south of Arenal Road. Hydrographs for these side discharges into the channel are shown in Table 1 (see Appendix), taken from BEC report. New hydrographs of the subbasins above were needed to represent current developed discharges into the side of the channel. Our study derived nine new hydrographs to replace the hydrographs above. Four new side flows, side flow 980' south of Sage Road, side flow 1000' north of Arenal Road, side flow 200' north of Arenal Road, and side flow 1150' south of Arenal Road were added and are shown in Table 2 (see Appendix). The hydrographs of the side flows in Table 2 were obtained from computations with peak runoffs and times of concentration. Peak runoffs were based from AHYMO runs, combined with times of concentration using SCS Upland Method, to obtain a list of hydrograph data points. The hydrograph results are shown in Table 2. Comparison between the new and the previous hydrographs of the Amole del Norte Channel can be made by referring to Tables 1 and 2 or to the graph. Table 2 shows that the new channel hydrograph peak discharge is slightly lower than that of the previous hydrograph, roughly 1891 cfs vs. 1902 cfs. This is achieved by several factors. First, the temporary surge pond at Arenal Road and Unser Blvd. was enlarged to detain enough runoff so that discharge to the channel via Arenal Road would not exceed previous discharge calculated by BEC report. Second, storm drain pipes from the pond to the channel were sized and placed at certain elevation in the pond to

control the flow to the channel. Third, side discharges north and south of Arenal Road were computed using adjusted areas giving lower times of concentration. The times to peak averaged at 14 minutes vs. 21 minutes computed from BEC report. As a result, the factors pointed out above derive a hydrograph shown on Table 2 with a peak discharge slightly lower than the one from BEC report.

The Appendix contains tables, graph, and computational datas regarding the analysis of the discharges to the Amole del Norte Channel. Basin ID map from Boyle Engineering Corporation report is attached, followed by tables and graph of the hydrograph for the channel. Hydrograph calculations and referencing datas gathered from BEC report make up the last part of the appendix in this section.

IV. THE PLAN

A four acre regional storm water detention facility shall be the backbone of the plan solution. The interim storage of storm water volumes in excess of the downstream storm drain carrying capacity for both the proposed Arenal Road storm drain and the Amole del Norte Diversion Channel shall be analyzed to achieve a balance runoff credit for the combined developing area of the participant's developments.

A. **Existing Conditions:** Presently, 100% of the offsite storm waters being accepted by the Amole del Norte Diversion Channel is from overland flows generated from the Westgate Heights Subdivision, Presley Homes Summerfield Subdivision, Unit One, and the undeveloped property west of the Amole del Norte Channel.

The existing storm drain in Sapphire Street releases its flows to the historical overland drainage route where they are eventually accepted by the channel via a side inlet approximately 800 feet south of Arenal Road.

B. **Proposed Improvements:** The required improvements are proposed for construction in three distinct and coordinated phases as follows:

1. Presley Homes: Sunrise Estates, Unit Two has the Sapphire Street storm drain extension to Unser Blvd.; the Kimela Road storm drain from the east end of the APS property to Unser Blvd.; the Unser Blvd. storm drain from Kimela to Arenal Road; and the temporary storm water detention and surge pond at Unser Blvd. and Arenal Road as found on the Required Infrastructure Listing of the subdivision and will be financially guaranteed and constructed.

2. Longford Homes of New Mexico: The Rolling Hills Subdivision Units Two through Five are allowed to develop independently of the Arenal Road storm drain. This is due to the fact that the Rolling Hills development has two interior backbone storm drains and separate connections to the Amole del Norte Diversion Channel approved per the Rolling Hills D.M.P.

3. Builders Investment Co. of NM, Ltd.: Development of the multi-phase Desert Springs Subdivisions is dependent upon the construction of the Unser Blvd. storm drain and the interim detention pond. These improvements will allow for the development of Unit One along Unser Blvd. The subsequent Units will require the construction of the Arenal Road storm drain and modifying the temporary detention/surge pond into the permanent regional storm water detention facility.

4. City of Albuquerque: The City has designated the Arenal Road storm drain as a masterplan facility and is currently on the City's 1997 C.I.P. funding of storm drainage projects. This improvement is required for the development of those subdivisions east of Desert Springs, Unit One.

5. Curb, Inc.: The development of this 60.2 acre parcel is dependent upon the Kimela Road and Unser Blvd. storm drainage improvements. The individual subdivisions shall be covered by a master drainage plan and will be required to have internal storm drain systems to supplement the street carrying capability to convey 100% of the offsite and onsite storm waters to the Amole del Norte Diversion Channel.

APPENDIX

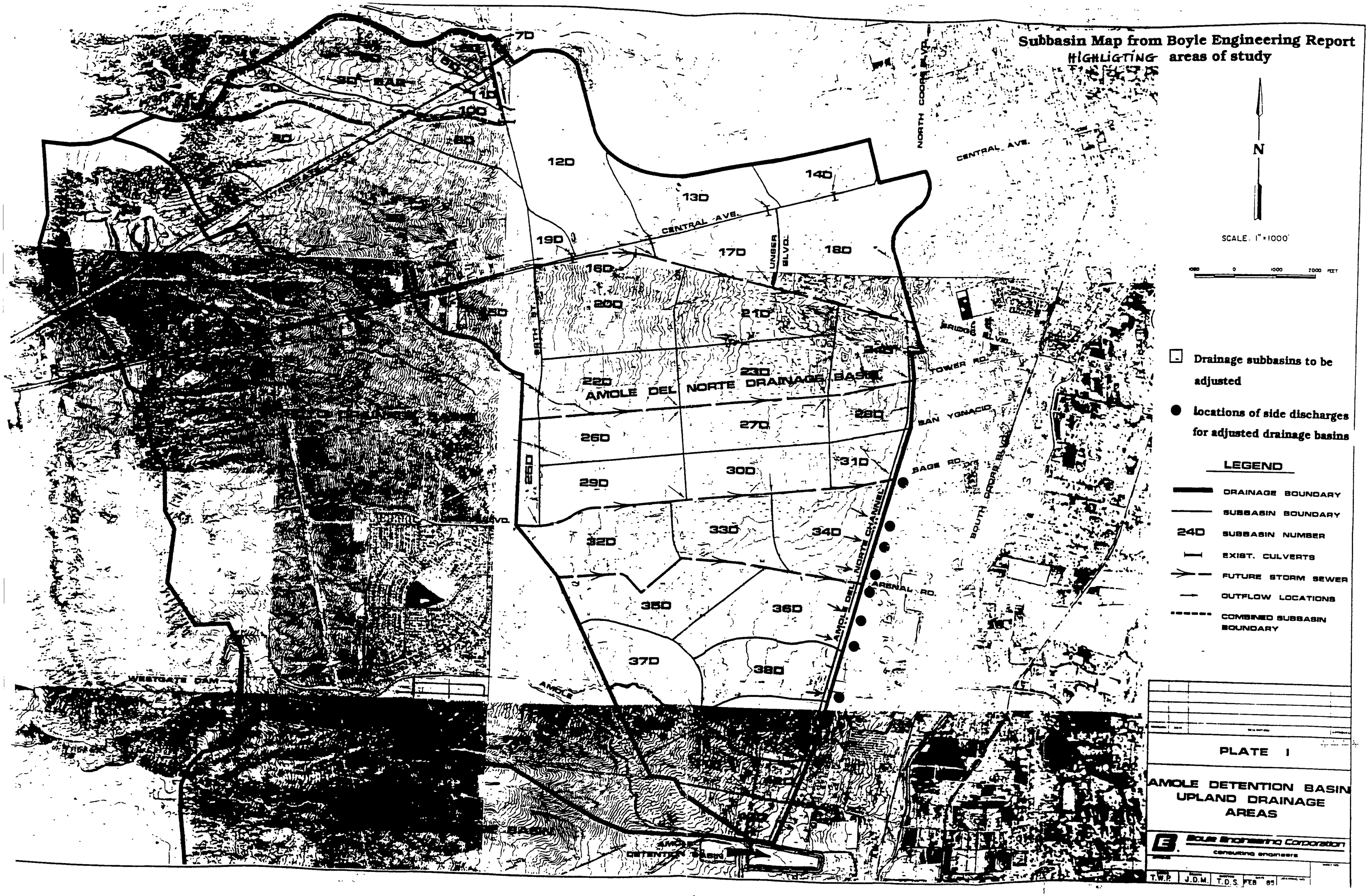

Subbasin Map from Boyle Engineering Report
HIGHLIGTING areas of study
N
SCALE. 1" = 1000'
1000 0 1000 2000 FEET
Drainage subbasins to be adjusted
locations of side discharges for adjusted drainage basins
LEGEND
DRAINAGE BOUNDARY
SUBBASIN BOUNDARY
24D SUBBASIN NUMBER
EXIST. CULVERTS
FUTURE STORM SEWER
OUTFLOW LOCATIONS
COMBINED SUBBASIN BOUNDARY
AMOLE DEL NORTE DRAINAGE BASIN
CENTRAL AVE.
NORTH COORS BLVD.
UNSER BLVD.
86TH ST.
TOWER RD.
SAN YGNACIO
SAGE RD.
SOUTH COORS BLVD.
ARENAL RD.
AMOLE DEL NORTE CHANNEL
AMOLE
WESTGATE DAM
AMOLE DETENTION BASIN
7D
9D
10D
11D
12D
13D
14D
16D
17D
18D
19D
20D
21D
22D
23D
24D
25D
26D
27D
28D
29D
30D
31D
32D
33D
34D
35D
36D
37D
38D
PLATE I
AMOLE DETENTION BASIN UPLAND DRAINAGE AREAS
Boyle Engineering Corporation
consulting engineers
T.W.P.
J.D.M.
T.D.S.
FEB 85

TABLE 1

For Reference
From the Amole del Norte Storm Diversion Facility Report February 1985, Boyle Engineering

NOTE:

A = Runoff from the proposed Tierra Bayita storm drain.

B = Sum of flows entering the Amole Channel from Tower so. to the Amole Basin.

C = Discharge from a proposed 35 ac-ft detention basin at the north end of the Amole Channel (inflow = A)

	A	B											C
TIME (HR)	DISCHARGE FROM PROPOSED TIERRA BAYITA STORM SEWER	SIDE FLOW AT TOWER ROAD	SIDE FLOW AT SAGE ROAD	SIDE FLOW AT ARENAL ROAD	SIDE FLOW 1700' SO. OF ARENAL	SIDE FLOW 3000' SO. OF ARENAL	SIDE FLOW 1100' NO. OF BLAKE	SIDE FLOW AT BLAKE ROAD	SIDE FLOW SOUTH OF BLAKE	B	A & B	DISCHARGE FROM PROPOSED 35 AC-FT DETENTION BASIN NO. OF TOWER ROAD	HYDROGRAPH PLOTTED (SEE GRAPH)
0.2	138	189	106	117	14	42	44	56	17	585	723	0	585
0.4	1323	547	210	317	75	84	135	62	33	1463	2786	210	1673
0.5	1368	600	176	280	79	65	109	47	26	1382	2750	520	1902
0.6	1178	527	142	242	63	45	83	32	18	1152	2330	690	1842
0.8	821	335	90	151	38	27	51	21	11	724	1545	735	1459
1.0	614	221	64	103	26	21	37	15	8	495	1109	780	1275
1.2	500	158	49	79	20	17	29	12	7	371	871	720	1091
1.4	411	123	39	64	17	14	24	10	5	296	707	600	896
1.6	342	102	33	53	14	11	20	8	5	246	588	525	771
1.8	290	86	28	46	12	10	17	7	4	219	500	465	675
2.0	249	73	24	40	11	9	15	6	3	181	430	380	561
2.2	215	64	21	35	9	8	13	6	3	159	374	330	489
2.4	190	57	18	31	8	7	12	5	3	141	331	280	421
2.6	168	50	16	28	8	6	10	5	2	125	293	230	355
2.8	150	45	15	25	7	6	10	4	2	114	264	200	314
3.0	136	41	14	23	6	5	9	4	2	104	240	175	279
3.2	125	38	13	21	6	5	8	4	2	97	222	155	252
3.4	115	35	12	20	5	5	8	4	2	91	206	135	226
3.6	106	32	11	19	5	4	7	3	2	83	189	120	203
3.8	98	31	11	18	5	4	7	3	2	81	179	105	186
4.0	92	29	10	17	4	4	7	3	2	76	168	95	171
4.2	87	27	10	16	4	4	6	3	1	71	158	87	158
4.4	82	26	9	15	4	4	6	3	1	68	150	82	150
4.6	78	25	9	15	4	3	6	3	1	66	144	78	144
4.8	75	24	8	14	4	3	6	3	1	63	138	75	138
5.0	71	23	8	13	4	3	5	3	1	60	131	71	131
5.2	68	22	8	13	3	3	5	2	1	57	125	68	125
5.4	66	21	7	12	3	3	5	2	1	54	120	66	120
5.6	63	20	7	12	3	3	5	2	1	53	116	63	116
5.8	60	20	7	12	3	3	5	2	1	53	113	60	113
6.0													

TABLE 2
NEW HYDROGRAPH FOR THE AMOLE DEL NORTE DIVERSION CHANNEL

TIME (HR)	DISCHARGE FROM PROPOSED TIERRA BAYITA STORM SEWER A	SIDE FLOW AT TOWER ROAD	SIDE FLOW AT SAGE ROAD	ADDITIONAL SIDE FLOW AT SAGE ROAD**	SIDE FLOW AT 980' S. OF SAGE ROAD**	SIDE FLOW AT 1000' N. OF ARENAL ROAD**	SIDE FLOW AT 200' N. OF ARENAL ROAD**	SIDE FLOW AT ARENAL ROAD*	SIDE FLOW 1150' S. OF ARENAL ROAD** B	SIDE FLOW 1650' S. OF ARENAL ROAD*	SIDE FLOW AT 3000' S. OF ARENAL ROAD*	SIDE FLOW 1100' N. OF BLAKE ROAD	ADDITIONAL SIDE FLOW AT 1100' N. OF BLAKE ROAD**	SIDE FLOW AT BLAKE ROAD	SIDE FLOW S. OF BLAKE ROAD	B*	A & B*	DISCHARGE FROM PROPOSED 35 AC-FT DETENTION BASIN N. OF TOWER ROAD C	B & C* HYDROGRAPH PLOTTED (SEE GRAPH)
0.2	138	189	106	29	36	170	56	45	116	104	305	44	35	56	17	1248	1386	0	1248
0.4	1323	547	210	76	2	14	1	156	46	40	183	135	34	62	33	1539	2862	210	1749
0.5	1368	600	176	76	1	3		188	24	15	91	109	16	47	26	1372	2740	520	1891
0.6	1178	527	142	66		1		188	9	8	48	83	11	32	18	1133	2311	690	1823
0.8	821	335	90	30				139	2	2	13	51	3	21	11	697	1518	735	1432
1.0	614	221	64	16				74	1	1	4	37	1	15	8	442	1056	780	1222
1.2	500	158	49	7				39			1	29		12	7	302	802	720	1022
1.4	411	123	39	3				22				24		10	5	226	637	600	826
1.6	432	102	33	2				12				20		8	5	182	524	525	707
1.8	290	86	28	1				7				17		7	4	150	440	465	615
2.0	249	73	24					3				15		6	3	124	373	380	504
2.2	215	64	21					2				13		6	3	109	324	330	439
2.4	190	57	18					1				12		5	3	96	286	280	376
2.6	168	50	16									10		5	2	83	251	230	313
2.8	150	45	15									10		4	2	76	226	200	276
3.0	136	41	14									9		4	2	70	206	175	245
3.2	125	38	13									8		4	2	65	190	155	220
3.4	115	35	12									8		4	2	61	176	135	196
3.6	106	32	11									7		3	2	55	161	120	175
3.8	98	31	11									7		3	2	54	152	105	159
4.0	92	29	10									7		3	2	51	143	95	146
4.2	87	27	10									6		3	1	47	134	87	134
4.4	82	26	9									6		3	1	45	127	82	127
4.6	78	25	9									6		3	1	44	122	78	122
4.8	75	24	8									6		3	1	42	117	75	117
5.0	71	23	8									5		3	1	40	111	71	111
5.2	68	22	8									5		2	1	38	106	68	106
5.4	66	21	7									5		2	1	36	102	66	102
5.6	63	20	7									5		2	1	35	98	63	98
5.8	60	20	7									5		2	1	35	95	60	95
6.0																			

NOTE:

A = Runoff from the proposed Tierra Bayita storm drain.

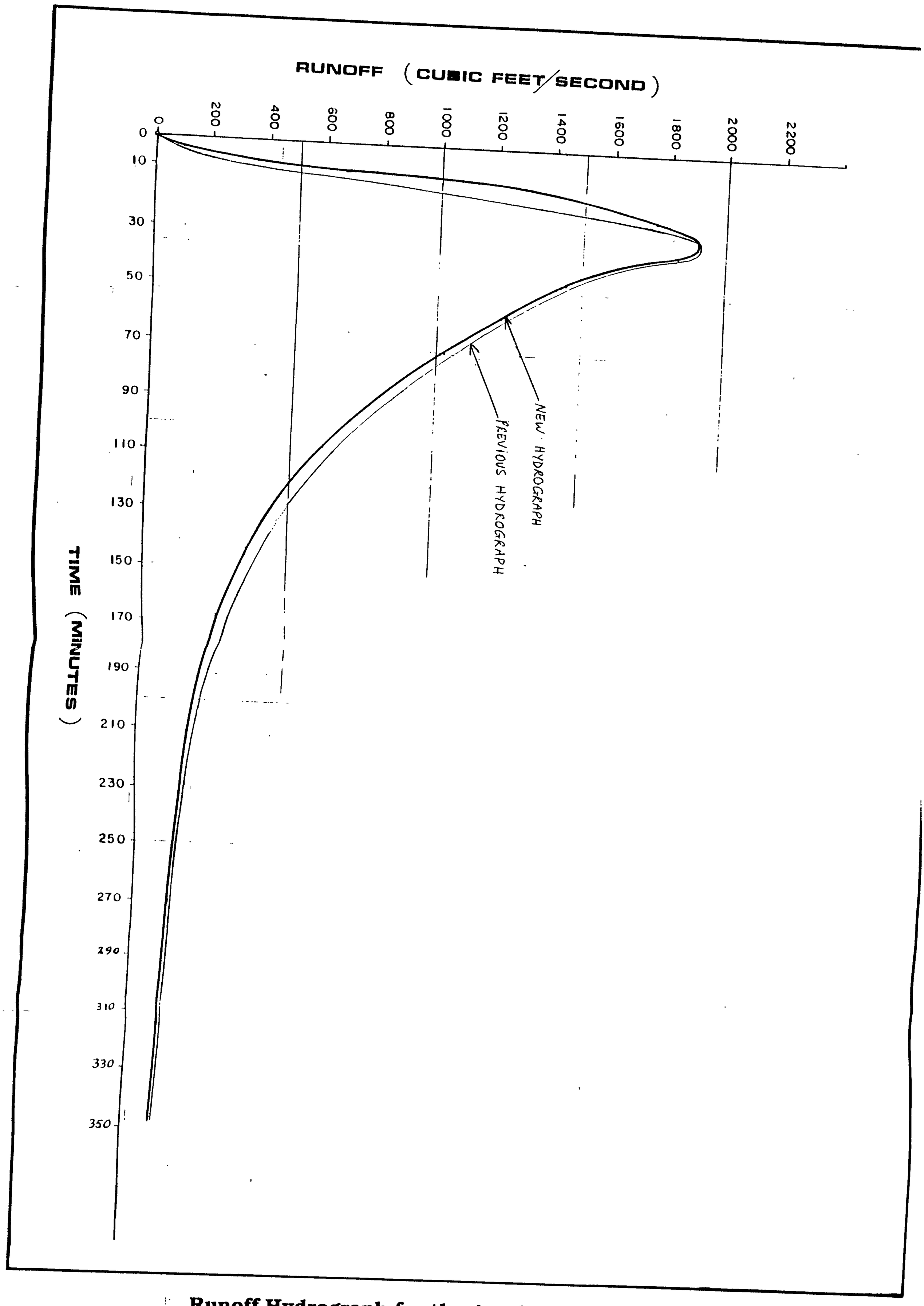
B = Sum of flows entering the Amole Channel from Tower south to the Amole Bain.

C = Discharge from a proposed 35 ac-ft detention basin at the north end of the Amole Channel (inflow = A).

*Values adjusted from Boyle Report, (see calculations section). FOR COMPARISON, SEE TABLE 1

**New side flow

903TABLE.DWGems 06/17/97



Runoff Hydrograph for the Amole del Norte Channel

HYDROGRAPH FOR BASIN 408 ⇒ 408A, 408B + 408C
(SIDE FLOW 3000' S. OF ARENAL ROAD)

BASIN LENGTH, (FT)	=	2974
DIFFERENCE IN ELEVATION ACROSS BASIN	=	56
SLOPE OF BASIN, (FT/FT)	=	.0188
AREA OF BASIN, (ACRES)	=	100.7
AREA OF BASIN, (SQ MI)	=	.15736
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (SCS UPLAND METHOD) (MIN)	=	23
TIME TO PEAK (MIN)	=	15
VOLUME OF RUNOFF (ACRE-FT) (from AHYMO run)	=	10.9
PEAK RUNOFF (CFS) (from AHYMO run)	=	327.60
RUNOFF PER ACRE (CFS/ACRE)	=	3.25

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	1.5	.030	9.83
3	.2	3.0	.100	32.76
4	.3	4.5	.190	62.24
5	.4	6.0	.310	101.56
6	.5	7.5	.470	153.97
7	.6	9.0	.660	216.22
8	.7	10.5	.820	268.63
9	.8	12.0	.930	304.67
10	.9	13.5	.990	324.32
11	1.0	15.0	1.000	327.60
12	1.1	16.5	.990	324.32
13	1.2	18.0	.930	304.67
14	1.3	19.5	.860	281.74
15	1.4	21.0	.780	255.53
16	1.5	22.5	.680	222.77
17	1.6	24.0	.560	183.46
18	1.7	25.5	.460	150.70
19	1.8	27.0	.390	127.76
20	1.9	28.5	.330	108.11
21	2.0	30.0	.280	91.73
22	2.2	33.0	.207	67.81
23	2.4	36.0	.147	48.16

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
24	2.6	39.0	.107	35.05
25	2.8	42.0	.077	25.23
26	3.0	45.0	.055	18.02
27	3.2	48.0	.040	13.10
28	3.4	51.0	.029	9.50
29	3.6	54.0	.021	6.88
30	3.8	57.0	.015	4.91
31	4.0	60.0	.011	3.60
32	4.5	67.5	.005	1.64
33	5.0	75.0	.000	.00

ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

Thomas O. Isaacson, PE & LS • Fred C. Arfman, PE
Scott M. McGee, PE

June 4, 1998

Ms. Susan Calongne, P.E.
City/County Floodplain Administrator
2400 Broadway SE
Albuquerque, NM 87102

RE: Desert Flower Revised Master Drainage Report (M10/D5)

Dear Ms. Calongne:

As per our phone discussion on June 4, 1998, I have enclosed a copy of the energy grade line calculations, preliminary channel/rundown calculations, and the revised Figure 1 for incorporation into the drainage report. Please note that all of the energy grade lines for streets at T-intersections have values less than 0.87 feet (typical property line elevation above the flowline).

Also, a review of the number of lots per unit was completed and a few errors were found. The corrected numbers are as follows:

Unit One:	85
Unit Two:	77
Unit Three:	115
Unit Four:	70
Unit Five:	142
Total	489

Please feel free to contact me if you have any further questions.

Sincerely,

ISAACSON & ARFMAN, P.A.

Melissa Combs

Melissa Combs
MC/rtl

128 Monroe St. NE • Albuquerque, NM 87108 • (505) 268-8828 • FAX (505) 268-2632

Spring Canyon Connection to Amole
Worksheet for Trapezoidal Channel

Project Description	
Project File	c:\haestad\fmw\dtfwrev.fm2
Worksheet	Spring Canyon Channel to Amole
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	6.00	%
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	10.00	ft
Discharge	128.80	cfs

Results		
Depth	0.62	ft
Flow Area	6.92	ft^2
Wetted Perimeter	12.75	ft
Top Width	12.46	ft
Critical Depth	1.55	ft
Critical Slope	0.002423	ft/ft
Velocity	18.62	ft/s
Velocity Head	5.39	ft
Specific Energy	6.00	ft
Froude Number	4.41	
Flow is supercritical.		

Notes:

* Preliminary Channel Sizing
* Assume Concrete Channel

PURPLE CONE RUNDOWN
Worksheet for Trapezoidal Channel

Project Description	
Project File	c:\haestad\fmw\dtfwrev.fm2
Worksheet	Purple Cone Rundown
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.022	
Channel Slope	1.30	%
Left Side Slope	8.00	H : V
Right Side Slope	8.00	H : V
Bottom Width	50.00	ft
Discharge	41.70	cfs

Results		
Depth	0.26	ft
Flow Area	13.61	ft^2
Wetted Perimeter	54.21	ft
Top Width	54.18	ft
Critical Depth	0.27	ft
Critical Slope	0.011012	ft/ft
Velocity	3.06	ft/s
Velocity Head	0.15	ft
Specific Energy	0.41	ft
Froude Number	1.08	
Flow is supercritical.		

Notes:

SLOPE OF THE CHANNEL LISTED IS THE AVERAGE SLOPE

PURPLE FRINGE RUNDOWN
Worksheet for Trapezoidal Channel

Project Description	
Project File	c:\haestad\fmw\dtfwrev.fm2
Worksheet	Purple Fringe Rundown
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.022	
Channel Slope	1.20	%
Left Side Slope	8.00	H : V
Right Side Slope	8.00	H : V
Bottom Width	50.00	ft
Discharge	45.20	cfs

Results		
Depth	0.28	ft
Flow Area	14.66	ft^2
Wetted Perimeter	54.53	ft
Top Width	54.49	ft
Critical Depth	0.29	ft
Critical Slope	0.010827	ft/ft
Velocity	3.08	ft/s
Velocity Head	0.15	ft
Specific Energy	0.43	ft
Froude Number	1.05	
Flow is supercritical.		

Notes:

SLOPE OF THE CHANNEL LISTED IS THE AVERAGE SLOPE

SALTBRUSH RD RUNDOWN
Worksheet for Trapezoidal Channel

Project Description	
Project File	c:\haestad\fmw\dtfwrev.fm2
Worksheet	Saltbrush Rd Rundown
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.022	
Channel Slope	1.00	%
Left Side Slope	8.00	H : V
Right Side Slope	8.00	H : V
Bottom Width	50.00	ft
Discharge	24.70	cfs

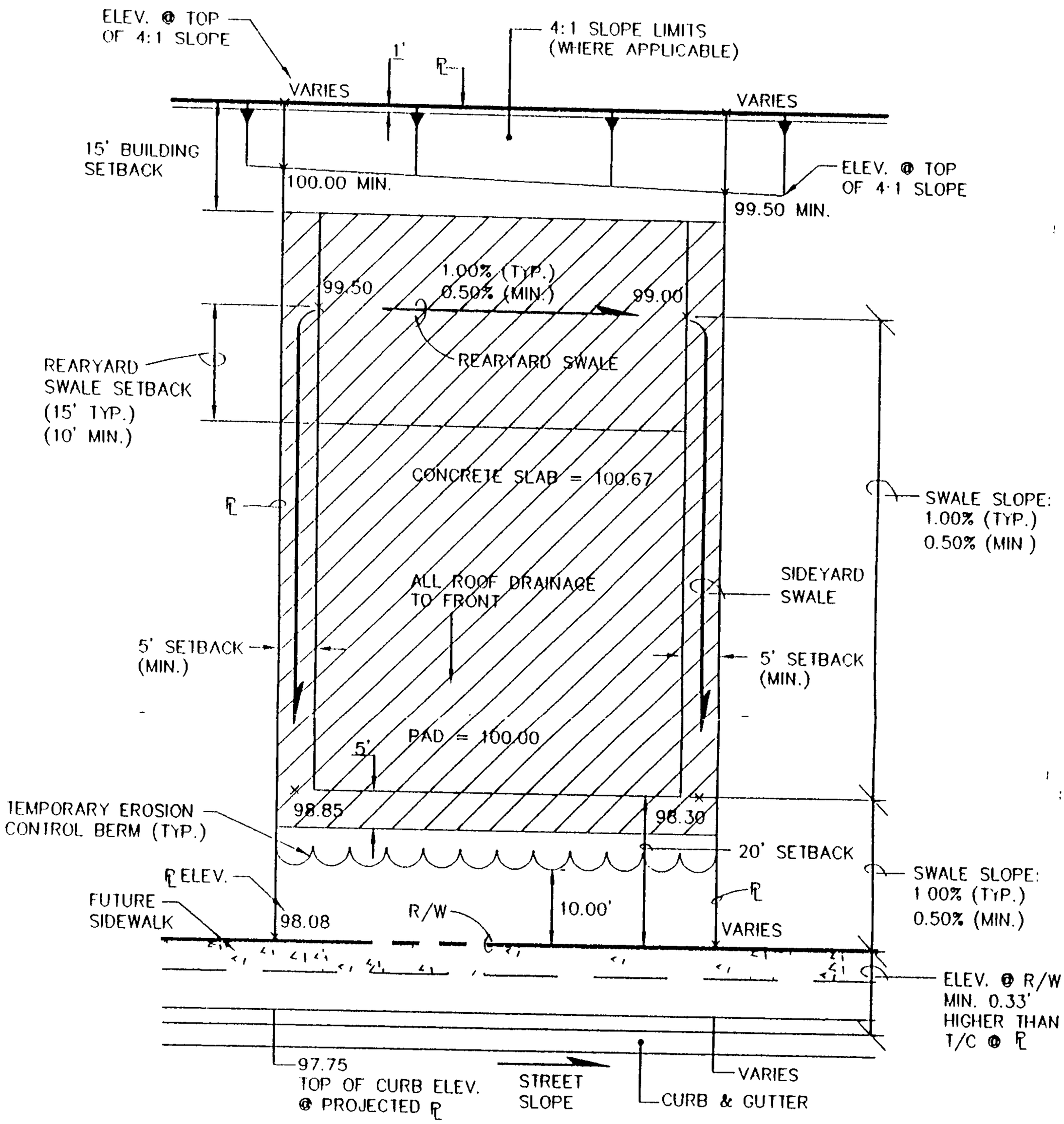
Results		
Depth	0.21	ft
Flow Area	10.68	ft^2
Wetted Perimeter	53.33	ft
Top Width	53.31	ft
Critical Depth	0.19	ft
Critical Slope	0.012302	ft/ft
Velocity	2.31	ft/s
Velocity Head	0.08	ft
Specific Energy	0.29	ft
Froude Number	0.91	
Flow is subcritical.		

Notes:

SLOPE OF THE CHANNEL LISTED IS THE AVERAGE SLOPE

Supplemental Table Energy Grade Line Calculations							
Street	**Location**	**Street Width**	**Curb Type**	**Slope (ft/ft)**	**Q100(cfs)**	**Depth (ft)**	**Energy Grade line**
Unit 5							
Most Easternly N/S Street	@Saltbrush Rd	28	STD	0.005	29.7	0.58	0.71
Saltbrush Rd	@Most Easternly N/S Street	28	STD	0.005	38	0.64	0.79
Purple Fringe Rd	@Most Easternly N/S Street	32	STD	0.005	25.89	0.54	0.65
April Flower Pl	@Most Easternly N/S Street	28	STD	0.005	13.2	0.44	0.5

* Please note that Purple Cone Rd and Spring Flower Rd both terminate in sump conditions, and therefore the flows do not have to turn



COMPACTION ZONE – CONTRACTOR SHALL COMPACT SOILS IN THIS AREA TO A MINIMUM OF 95% COMPACTION PER ASTM D698, FOR A DEPTH OF 12 INCHES.

TYPICAL LOT GRADING SHOWING COMPACTION ZONE

1"=20'

FIGURE

CITY OF
Albuquerque
Public Works Department

May 19, 1997

Martin J. Chávez, Mayor

Robert E. Gurulé, Director

Fred C. Arfman, P.E.
Isaacson & Arfman
128 Monroe Street NE
Albuquerque, New Mexico

RE: Drainage Report and Grading Plan for Desert Flower Subdivision Unit 1 (M10/D5) Submitted for Preliminary Plat Approval, Engineer's Stamp Dated 4/24/97 and 4/25/97.

Dear Mr. Arfman:

Prior to approval for Preliminary Plat action, more information is required. Please address the following comments:

1. It appears that this plan is part of a Master Drainage Plan, however, the above referenced report must be able to stand alone. This report must contain the pertinent information from the Master plan. Is free discharge allowed? It is my understanding that the Amole del Norte channel can only handle controlled discharge.

2. What is the status of the Master Drainage Plan? Until the Master Plan is approved, this subdivision will not be approved.

3. It appears that off-site flows from Basin 402 impact this site. How do you propose to intercept these flows in the interim and in the ultimate condition? Is a storm drain system proposed in Unser?

4. The report indicates that Unit 4 will include an outfall pipe from the subdivision to the Amole del Norte channel. This outfall pipe must be bonded with the first Unit. All public storm drain easements or right-of-way must be in place for this outfall pipe with Unit 1. The connection between the subdivision and the Amole must be identified at this time.

5. The report states that developed flows from Unit 1 will enter a temporary surge/retention pond. Please show this pond, and all ponds, on the grading plans. The ponds must be within public drainage easements, and Agreement and Covenants will be required. Unless downstream capacity is addressed, these temporary ponds should be retention ponds. Retention ponds must be sized for the 100-year, 10-day storm. Provide the pond volume calculations.

May 19, 1997

6. Unit 3 proposes to pick up street flows from Unser and pond on the site. Is this pond temporary? Is a storm drain system required in this portion of Unser in the ultimate condition? Typically ponds do not discharge into the streets.

7. The plan must identify all storm drain sizes. These must also be identified on the Infrastructure List. Provide storm drain capacity calculations.

8. Please reference the current FEMA flood maps. The 1983 flood maps are no longer valid.

9. Provide the typical street sections used in the capacity calculations.

If you should have any questions regarding these comments, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Bo Johnson, Owner
File

Isaacson & Arfman, P.A.

Consulting Engineering Associates

128 Monroe Street, N.E.

Albuquerque, NM 87108

(505) 268 - 8828

CONCEPTUAL

DRAINAGE REPORT

FOR

ALBUQUERQUE SOUTH

UNIT 1

SOUTHWEST CORNER OF UNSER BLVD SW

AND ARENAL ROAD SW

ALBUQUERQUE NEW MEXICO

MAY 1987

CONCEPTUAL

DRAINAGE REPORT

FOR

ALBUQUERQUE SOUTH

UNIT 1

SOUTHWEST CORNER OF UNSER BLVD. SW
AND ARENAL ROAD SW

ALBUQUERQUE NEW MEXICO

MAY 1987

RECEIVED
MAY 27 1987
HYDROLOGY SECTION

FRED C. ARFMAN
NEW MEXICO
7322
REGISTERED PROFESSIONAL ENGINEER

Prepared by:

Isaacson & Arfman, P.A.
Consulting Engineering Associates
128 Monroe NE
Albuquerque, N.M. 87108

Fred C. Arfman 5-27-87
Fred C. Arfman Date

I. INTRODUCTION

This Conceptual Drainage Report satisfies one of the requirements for the Bulk Land Plat being prepared for this tract of land containing 174.54 acres. This tract is within the municipal limits of the City of Albuquerque, and is currently zoned Residential (R-1). See Vicinity Map in Appendix.

A pre-design meeting was held May 4, 1987, with Fred Aguirre, Roger Green, and Stuart Reeder all of whom are with the Hydrology Review Section of the Utility Development Division of the City of Albuquerque. The following findings were established as criteria for this project.

1. The Conceptual Grading and Drainage Plan shall identify required drainage easements and infrastructure improvements (major facilities), which are to be waived as part of the Bulk Land Plat.

2. All 100-year flood plains must be dedicated as public drainage easements.

3. All required offsite drainage easements must be obtained prior to Bulk Land Plat sign-off by the City Engineer.

4. All temporary drainage facilities must be maintained by the developer and a Covenant/Agreement must be executed for maintenance responsibilities.

5. Unneeded easements should be vacated with the Bulk Land Plat which requires application for public hearing at the Development Review Board.

6. Include information from the Amole Drainage Report showing allowed rates of discharge to the Amole Channel, etc.

II. EXISTING SITE CONDITIONS

A. Flood Hazard - A small portion of this site is inundated by the 100-year storm as shown on Panel 33 of the FEMA flood maps (a copy of which is included in the Appendix). This flood hazard area is located along the future right-of-way of Arenal Road west of Unser Blvd. SW.

B. Temporary Drainage Easements - Three temporary drainage easements cross the site (as shown on the Conceptual Drainage Plan), running in an east-west direction. One of these easements was intended to cover the flood hazard area described above, but the two do not coincide.

C. Soils - From the SCS Soil Survey of Bernalillo County, these Bluepoint loamy fine sand and Madurez-Wink association soils are classified as Hydrologic Soil Groups 'A' and 'B'.

D. Topography - Present conditions are such that stormwaters flow from the west to the east. Offsite flows are carried through the site in two identifiable drainage courses, while onsite runoff is typically overland sheet flow until intercepted by one of these existing gullies. Site slopes are typically 2 percent with a small area in the northern portion having a slope of 6 to 7 percent.

E. Stage of Development - With the exception of a sanitary sewer line which crosses in the southern portion, this site is undeveloped. Vegetation is primarily native grasses and ground cover typical of the west mesa.

III. OFFSITE CONDITIONS

A large offsite area discharges its stormwaters across this site. This area is bounded by the Snow Vista Channel on the west, by Sage Road SW on the north, by the Vista del Sol Mobile Home Park development on the south, and Unser Blvd. (South of Sage Road) and the site itself on the east. A large part of this offsite area is already developed and is composed of the Westgate Heights Addition, Unit 2. As shown on the attached Offsite Drainage Exhibit, there are four discharge points where these offsite flows are released into the subject site.

As mentioned previously, there are three existing temporary drainage easements that allow offsite flows to cross the site. Drainage easements will be required for the property immediately to the east of the site to allow these flows to continue downstream to the existing right-of-way for the Amole del Norte Channel. This channel presently is concrete lined up to a point approximately 850 feet east of the site's southeast corner. The upstream continuation of this channel is scheduled to be included in a 1988-1989 bond issue.

The combined onsite and offsite areas are approximately 500 acres, therefore runoff computational methods suggested by the Soil Conservation Service will be used. Runoff quantity calculations for the offsite area are

included in the Appendix along with an offsite drainage exhibit.

IV. ONSITE CONDITIONS

As part of this bulk land plat, no changes are proposed to the existing site conditions. Runoff quantities are computed for the undeveloped site and also for a future scenario assuming 100% residential development (see Appendix). This developed condition scenario will help to establish limits on runoff based upon design capacities of the Amole del Norte Diversion Channel.

Temporary Drainage Easements onsite will also be redefined and re-dedicated to more accurately follow existing drainage courses and cover flood plains as outlined on the FEMA flood maps.

The 174 acres of undeveloped lands covered by this conceptual drainage study and bulk land plat are intended to be subdivided into eight tracts (Trs. A - H). These tracts all contain residential (R-1) zoned land and subsequent platting actions will therefore be required. All of the tracts are of considerable size in acreage, with the exception of Tracts B and H.

Tract B is created by the future realignment of Arenal and Unser. It shall be incorporated into the land to the northeast once those lands are platted. Those lands to the northeast are also part of the land holding of Albuquerque South General Partnership. Tract H is only 0.46 acres in area and is nested between the Mary Ann Binford Elementary School and Corriz Street. The planning section of the Albuquerque Public Schools has scheduled to take ownership of the parcel for incorporation into the

adjacent school site. The drainage characteristics of these two small tracts are not investigated to the same degree as the remaining tracts due to their planned incorporation into other tracts owned by either Albuquerque South General Partnership or the Albuquerque Public School system.

Of the remaining tracts, only Tract A is suitable for development primarily due to the availability of City water. Drainage from the this tract shall be collected at a point(s) on the westerly right of way of Unser, carried in a storm drain facility across Unser, then released to an open vee-ditch which would be located in the proposed 60' temporary drainage easement between tracts F and G.

How?

Tract C drainage will split with a portion being carried in the above mentioned vee-ditch eastward to the Amole Channel. The northern half of Tract C will drain to a future facility in the Arenal Road right of way. Temporary drainage easements shown will provide the means for undeveloped flows to reach the Amole Channel.

Tract D will also drain to the temporary drainage easement shown in the future right of way of Arenal Road west of Unser Blvd. This tract will continue to accept offsite flow as shown until Unser Blvd. is improved and can then carry public stormwaters.

Drainage from Tract E will also be collected west of Unser, carried through the public right of way, then released within a realigned temporary drainage easement running through Tract F.

Tract F will discharge part of its runoff to this same drainage easement. These combined flows will then be

routed north to circumvent the Unplatted Land, across which there currently are no easements. These waters, and runoff from the north half of Tract F, will be collected by the previously mentioned vee-ditch, along the south line of Valley West, and carried eastward to the Amole Channel.

The remaining tract, Tract G, will shed waters north and south to the temporary drainage easements shown. Existing drainage easements are to be vacated as they are not necessary.

V. DOWNSTREAM ANALYSIS

Runoff from this site historically flows eastward and contributes to the Arenal Retention pond, approximately one-half mile downstream. The Amole del Norte Diversion Channel is designed to intercept this runoff at various points south of Arenal.

Downstream capacity therefore exists once flows enter this facility. Until this channel can be extended upstream however, an interim solution will be required to handle both the onsite and offsite flows. The proposed drainage solution is a ditch/dike system located along the westerly right-of-way line of the existing channel. This temporary earthen ditch would carry flows south to a desiltation pond at the upstream end of the concrete lined Amole Channel.

There are several benefits associated with this type of interim drainage solution:

1. Aligning the ditch/dike system adjacent to the existing channel right-of-way will provide adequate

flood-proofing during the time of construction, but will not interfere with the actual construction within the right-of-way.

2. By stockpiling excavated material from the ditch and placing it in a dike adjacent to the ditch, earthwork balances will remain unaffected for the Amole del Norte Diversion Channel.

3. The desiltation pond at the downstream end of the ditch/dike system will provide an area for reduced flow velocities and the precipitation of suspended solids, thereby releasing cleaner runoff into the concrete channel.

VI. EROSION CONTROL

The temporary ditch/dike system will act as a water barrier and will therefore prohibit any downstream erosion. The proposed desiltation pond will collect any material being carried downstream. Since the ditch/dike system is planned to be replaced by the lined Amole Channel within 2-3 years, no re-seeding requirements will be imposed for the dike itself.

VII. SUMMARY & RECOMMENDATIONS

There will be no increase in storm runoff quantities associated with this bulk land plat. The flooding occurring downstream is a historic condition and planned improvements should help to alleviate the problem.

Drainage easements do not exist on the property immediately east of this site, although public storm waters cross this property. Easements shall be sought

across the property as well as redefining the location of existing easements across the site to encompass the historic drainage courses.

The interim ditch/dike drainage solution is very desireable at this time since it allows for the better utilization of the existing drainage infrastructure immediately downstream. As stated, the second phase of the Amole Del Norte Diversion Channel is scheduled with funding out of the 1988-89 bond elections, therefore the interim solution may be replaced within a one or two year time frame.

APPENDIX

No.	Description	Page No.
1.	Drainage Information Sheet	11
2.	Hydrology Pre-Design Conference Recap	12
3.	Vicinity Map	13
4.	Flood Hazard Map	14
5.	Soils Map	15
6.-10.	Offsite Runoff Table and Calculations	16-20
11. & 12.	Total Combined Runoff Calculations	21-22
13.	Ditch/Dike Section	23
14.	Offsite Drainage Exhibit	24
15.	Conceptual Drainage Plan	In Pocket

DRAINAGE INFORMATION SHEET

PROJECT TITLE: ALBUQUERQUE SOUTH ZONE ATLAS/DRAINAGE FILE # M-10/D5

LEGAL DESCRIPTION: REMAINDER UNIT 1 OF TRACT KK, SECTION 34, T10N, R2E, TOWN OF ATRISCO GRANT

CITY ADDRESS: SW CORNER OF UNSER BLVD & ARENAL ROAD SW

ENGINEERING FIRM: ISAACSON & ARFMAN, P.A. CONTACT: FRED ARFMAN

ADDRESS: 128 MONROE NE PHONE: 268-8828

OWNER: ALBUQUERQUE SOUTH GENERAL PARTNERSHIP CONTACT: RJ SCHAEFER

ADDRESS: 7301 INDIAN SCHOOL · SUITE B PHONE: 883-7666

ARCHITECT: NONE CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: HALL SURVEYING CO. CONTACT: VERLON HALL

ADDRESS: 337 EUBANK NE PHONE: 292-1115

CONTRACTOR: NONE CONTACT: _____

ADDRESS: _____ PHONE: _____

PRE-DESIGN MEETING:

X YES

___ NO

X COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. _____

EPC NO. _____

PROJECT NO. _____

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

X CONCEPTUAL GRADING & DRAIN PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SECTOR PLAN APPROVAL

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

X OTHER BULK LAND PLAT (SPECIFY).

DATE SUBMITTED: May 27, 1987

BY: Scott A. McGee

REV. 10/85

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION/DESIGN HYDROLOGY SECTION

CONFERENCE RECAP

DRAINAGE FILE/ZONE ATLAS PAGE NO.: M-10 DATE: 5-4-87

PLANNING DIVISION NOS: EPC: _____ DRB: _____

SUBJECT: Bulk Land Plat - Albuquerque South Unit 1

STREET ADDRESS (IF KNOWN): S.W Corner of Unser Blvd & Arenal Rd.

SUBDIVISION NAME: Tract KK Sec 24, T10N, R2E

APPROVAL REQUESTED:

_____	PRELIMINARY PLAT	_____	FINAL PLAT
_____	SITE DEVELOPMENT PLAN	_____	BUILDING PERMIT
X	OTHER Bulk Land Plat	_____	ROUGH GRADING

ATTENDANCE:	WHO	REPRESENTING
	Fred Aguirre	City Hydrology
	FRED ARFMAN	ISSACSON & ARFMAN
	SCOTT MCKEE	"
	ROGER GREEN	CITY HYDROLOGY
	STUART REEDER	"

FINDINGS:

(1). Conceptual Grading & Drainage Plan is required to identify required drainage easements and infrastructures to be waived with the Bulk land plat. (Major Facilities)

(2). All 100 yr Flood plains must be dedicated as public drainage easement.

(3) All required offsite drainage easements must be obtained prior to Bulk Land Plat signoff by the City Engineer.

(4) All temporary drainage facilities must be maintained by the developer and a Covenant/Agreement must be executed for maintenance responsibilities.

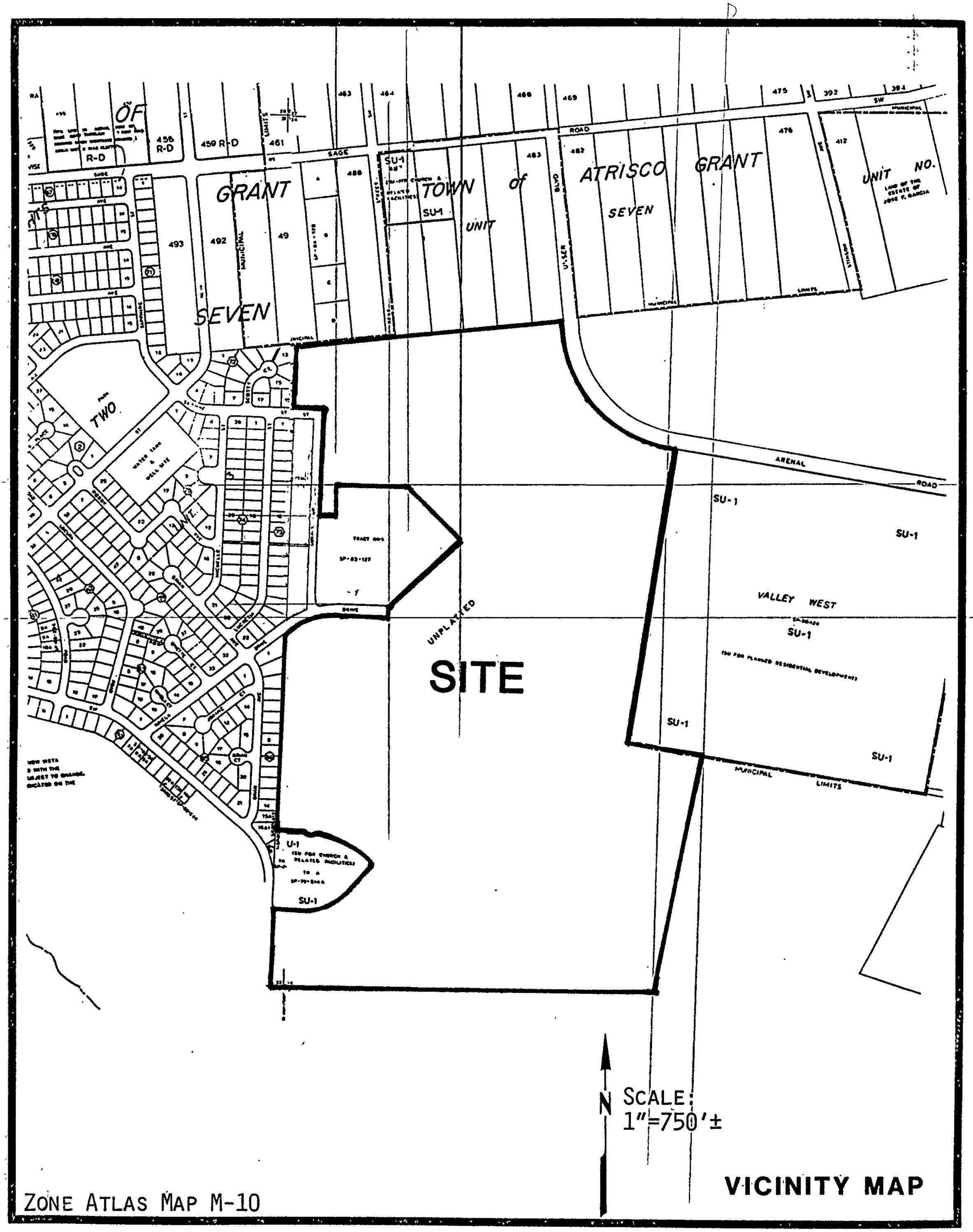
(5). Unneeded easements should be vacated with the Bulk land plat, This requires application for public hearing at the DRB.

(6) Include information from the Amole Drainage Report showing allowed rates of discharge to the Amole channel etc.

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED:	Roger L Green	SIGNED:	[illegible]
TITLE:	Civil Engineer	TITLE:	V.P.-ENGR
DATE:	5-4-87	DATE:	5/4/87

NOTE PLEASE PROVIDE A COPY OF THIS RECAP WITH THE DRAINAGE SUBMITTAL



ZONE ATLAS MAP M-10

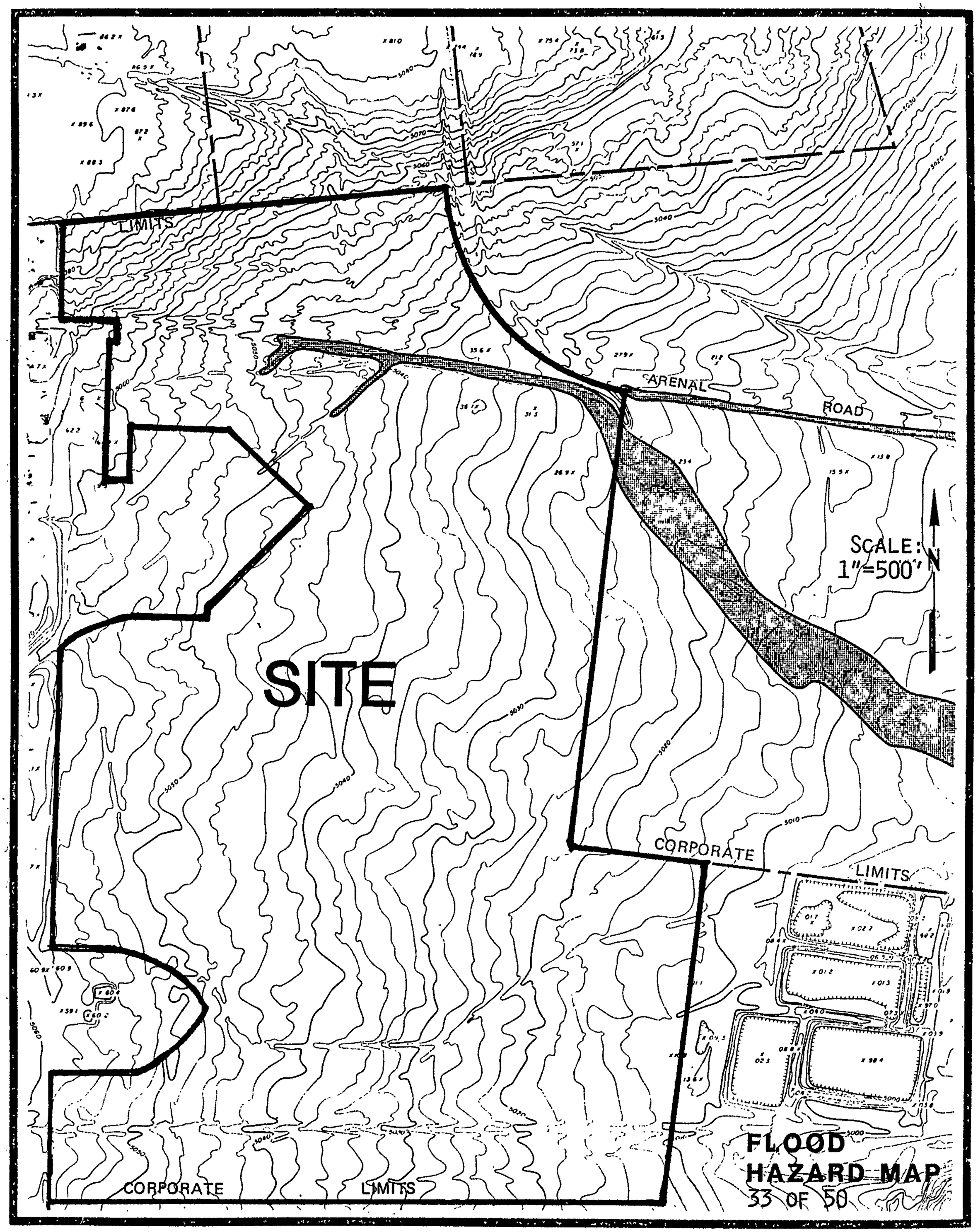
N SCALE: 1"=750'±

VICINITY MAP

Isaacson & Arfman, P.A.

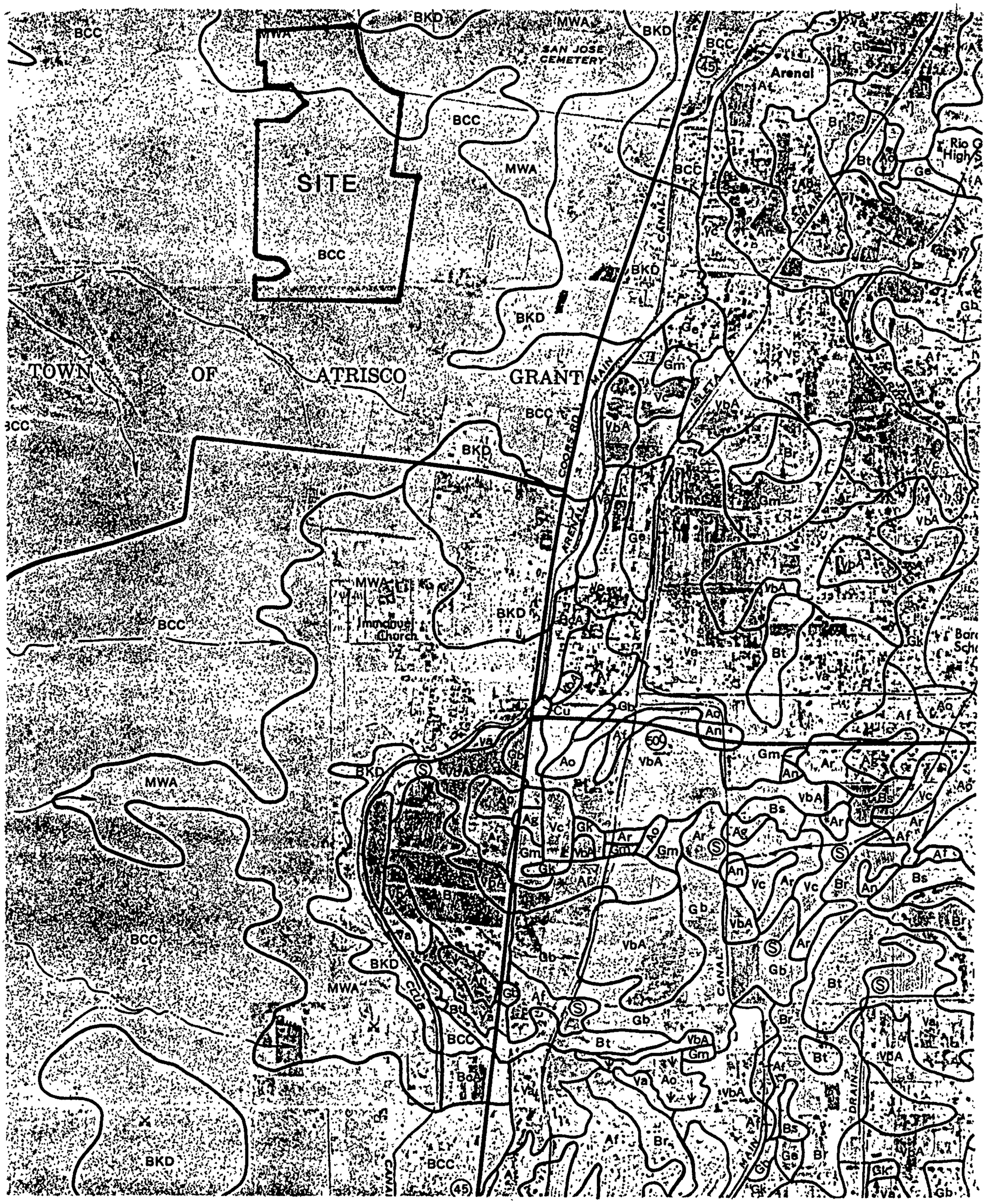
SUBJECT ALBUQUERQUE SOUTH JOB NO.____

BY SMM DATE 5·11·87 SHEET NO. 13 OF____



Isaacson &
Arfman, P.A.

SUBJECT ALBUQUERQUE SOUTH JOB NO.
BY SMM DATE 5·12·87 SHEET NO. 14 OF



SCALE:
1"=2000'

SOILS MAP
PAGE 40

Isaacson & Arfman, P.A.

SUBJECT _____ JOB NO. ____

BY _____ DATE _____ SHEET NO. 15 OF ____

OFFSITE RUNOFF

Stormwater flows discharging to this site are divided into four (4) drainage areas as shown on the Offsite Drainage Exhibit. For the most part Area 1 is undeveloped while Areas 2, 3, & 4 are existing residential developments. None of these areas individually exceeds 320 acres, but combining the offsite and onsite areas yields approximately 500 acres. Runoff computation methods suggested by the SCS will therefore be used when considering total onsite and offsite runoff areas together.

The following table however, shows offsite runoff values based on the Rational Method, for each individual Offsite area:

Offsite Flow Area	Q (cfs) 100 Yr	Q (cfs) 10 Yr	V (ac. ft.) 100 Yr	V (ac. ft.) 10 Yr
1	63	41	4.3	2.8
2	176	116	11.3	7.4
3	140	92	5.7	3.7
4	80	53	6.3	4.1

RUNOFF CALCULATIONS

(Rational Formula)

PROJECT: Albuquerque South Analysis Point# O.F. #1

DRAINAGE AREA:

Planimeter Rdg. 676 x .015

x Map Scale (1" = 500') 2 ÷ 43,560 A = 58 acres

TIME OF CONCENTRATION:

Drainage Basin Data:

L = 2,370 ft., fall = 38 ft., slope = 0.016 ft/ft

☒ Overland Flow: L = 870 H = 10'

v = 0.7 ft/sec (Pl 22.2 B-1)

Tc = 1,243 sec. = 20 min. Tc = 20 min.

☐ Street Flow:

v = _____ ft/sec. (Pl 22.2 B-2)

Tc = _____ sec. = _____ min. Tc = — min.

☒ Arroyo Flow:

$Tc = 0.0078 \frac{(1500)\ L^{0.77}}{S^{0.385}}$ = 10 min. Tc = 10 min.

0.019

Σ Tc = 30 min.

RUNOFF COEFFICIENT:

Development	C	x	A*	÷ 100	Cc**
Streets, Drives & Walks	.95				
Roofs	.90				
Lawns & Landscaping	.25				
Undeveloped	.40		1.00		
				=	

C = 0.40

RAINFALL INTENSITY:

100 year depth = 2.2 " (Pl. 22.2 D-1)

Intensity Factor = 1.23 (Pl.22.2 D-2)

Intensity = depth x factor I = 2.7 "/hr.

PEAK RUNOFF RATE:

Q = CIA = 0.4 (developed runoff) x 2.7 x 58 Q_{100} = 63 cfs

x 0.657 = Q_{10} = 41 cfs

VOLUME OF RUNOFF:

V = C x Rainfall Depth x Area

= 0.4 x $\frac{2.2}{12}$ x 58 ~~x 43,560~~ V_{100} = 4.3 ac. cu. ft.

x 0.657 = V_{10} = 2.8 ac. cu. ft.

* Percent of Total Area

** C Value Component

Prepared By: SMcGee

Date : May 8, 1987

(5/86)

RUNOFF CALCULATIONS

(Rational Formula)

PROJECT: Albuquerque South **Analysis Point#** O.F. #2

DRAINAGE AREA:

Planimeter Rdg. 1430 x .015

x Map Scale (1" = 500') 2 ÷ 43,560 A = 123 acres

TIME OF CONCENTRATION:

Drainage Basin Data:

L = 4900 ft., fall = 79 ft., slope = 0.016 ft/ft

☐ Overland Flow:

v = _____ ft/sec (P1 22.2 B-1)

Tc = _____ sec. = _____ min. Tc = — min.

☒ Street Flow:

v = 3.4 ft/sec. (P1 22.2 B-2)

Tc = 823 sec. = 14 min. Tc = 14 min.

☒ Arroyo Flow:

$$Tc = 0.0078 \frac{L^{0.77}}{S^{0.385}} = 13 \text{ min.}$$

2100

1.9

Tc = 13 min.

Σ Tc = 27 min.

RUNOFF COEFFICIENT:

Development	C	x	A*	÷ 100	Cc**
Streets, Drives & Walks	.95				
Roofs	.90				
Lawns & Landscaping	.25				
Undeveloped	.40				

Assumed for existing residential development → C = 0.50

RAINFALL INTENSITY:

100 year depth = 2.2 " (P1. 22.2 D-1)

Intensity Factor = 1.3 (P1.22.2 D-2)

Intensity = depth x factor I = 2.86 "/hr.

PEAK RUNOFF RATE:

Q = CIA = 0.5 x 2.86 x 123 Q_{100} = 176 cfs

x 0.657 = Q_{10} = 116 cfs

VOLUME OF RUNOFF:

V = C x Rainfall Depth x Area

$$= 0.5 \times \frac{2.2}{12} \times 123 \cancel{\times 43{,}560}$$

V_{100} = 11.3 ac. ~~cu.~~ ft.

x 0.657 = V_{10} = 7.4 ac. ~~cu.~~ ft.

* Percent of Total Area

** C Value Component

Prepared By: S McLane

Date : 5-8-87

(5/86)

RUNOFF CALCULATIONS

(Rational Formula)

PROJECT: Albuquerque South Analysis Point# O.F. #3

DRAINAGE AREA:

Planimeter Rdg. 725 x .015

x Map Scale (1" = 500') 2 ÷ 43,560 A = 62 acres

TIME OF CONCENTRATION:

Drainage Basin Data:

L = 2250 ft., fall = 39 ft., slope = 0.017 ft/ft

☐ Overland Flow:

v = _____ ft/sec (Pl 22.2 B-1)

Tc = _____ sec. = _____ min. Tc = — min.

☒ Street Flow:

v = 3.5 ft/sec. (Pl 22.2 B-2)

Tc = 643 sec. = 11 min. Tc = 11 min.

☐ Arroyo Flow:

$Tc = 0.0078 \frac{L^{0.77}}{S^{0.385}}$ = _____ min. Tc = — min.

Σ Tc = 11 min.

RUNOFF COEFFICIENT:

Development	C	x	A*	÷ 100	Cc**
Streets, Drives & Walks	.95				
Roofs	.90				
Lawns & Landscaping	.25				
Undeveloped	.40				

Assumed for existing residential development → C = 0.30

RAINFALL INTENSITY:

100 year depth = 2.2 " (Pl. 22.2 D-1)

Intensity Factor = 2.05 (Pl.22.2 D-2)

Intensity = depth x factor I = 4.51 "/hr.

PEAK RUNOFF RATE:

Q = CIA = 0.5 x 4.51 x 62 Q_{100} = 140 cfs

x 0.657 = Q_{10} = 92 cfs

VOLUME OF RUNOFF:

V = C x Rainfall Depth x Area

= 0.5 x $\frac{2.2}{12}$ x 62 x 43,560 V_{100} = 5.7 ac. cu. ft.

x 0.657 = V_{10} = 3.7 ac. cu. ft.

* Percent of Total Area

** C Value Component

Prepared By: SMcLee

Date : 5-8-87

(5/86)

RUNOFF CALCULATIONS

(Rational Formula)

PROJECT: Albuquerque South **Analysis Point#** O.F. #4

DRAINAGE AREA:

Planimeter Rdg. 800 x .015

x Map Scale (1" = 500') 2 ÷ 43,560 A = 69 acres

TIME OF CONCENTRATION:

Drainage Basin Data:

L = 5000 ft., fall = 80 ft., slope = 0.016 ft/ft

☒ Overland Flow: L=1400, H= 23

v = 1.0 ft/sec (P1 22.2 B-1)

Tc = 1400 sec. = 23 min. Tc = 23 min.

☒ Street Flow: L = 3600, H=52

v = 3.3 ft/sec. (P1 22.2 B-2)

Tc = 1090 sec. = 18 min. Tc = 18 min.

☐ Arroyo Flow:

Tc = 0.0078 $\frac{L0.77}{S0.385}$ = _____ min. Tc = — min.

Σ Tc = 41 min.

RUNOFF COEFFICIENT:

Development	C	x	A*	÷ 100	Cc**
Streets, Drives & Walks	.95				
Roofs	.90				
Lawns & Landscaping	.25				
Undeveloped	.40				

Assumed for ext. residential development = _____ C = 0.50

RAINFALL INTENSITY:

100 year depth = 2.2 " (P1. 22.2 D-1)

Intensity Factor = 1.05 (P1.22.2 D-2)

Intensity = depth x factor I = 2.31 "/hr.

PEAK RUNOFF RATE:

Q = CIA = 0.5 x 2.31 x 69 Q_{100} = 80 cfs

x 0.657 = Q_{10} = 53 cfs

VOLUME OF RUNOFF:

V = C x Rainfall Depth x Area

= 0.5 x $\frac{2.2}{12}$ x 69 x 43,560 V_{100} = 6.3 ac. cu. ft.

x 0.657 = V_{10} = 4.1 ac. cu. ft.

* Percent of Total Area

** C Value Component

Prepared By: [illegible]

Date : 5-8-87

(5/86)

RUNOFF CALCULATIONS

(Rational Formula)

PROJECT: Albuquerque South Analysis Point# 1

DRAINAGE AREA:

Planimeter Rdg. _____ x .015

x Map Scale _____ 2 ÷ 43,560 A = 231 acres

TIME OF CONCENTRATION:

Drainage Basin Data:

L = 9,500 ft., fall = 137 ft., slope = 0.014 ft/ft

☒ Overland Flow:

v = 0.8 ft/sec (Pl 22.2 B-1)

Tc = 3,375 sec. = 56 min. Tc = 56 min.

☒ Street Flow:

v = 3.4 ft/sec. (Pl 22.2 B-2)

Tc = 823 sec. = 14 min. Tc = 14 min.

☒ Arroyo Flow:

$$Tc = 0.0078 \frac{L^{0.77}}{S^{0.385}} = 22 \text{ min.}$$

(4000) (1.8)

Tc = 22 min.

Σ Tc = 92 min.

RUNOFF COEFFICIENT:

Development	C	x	A	÷ 100	Cc
Streets, Drives & Walks	.95				
Roofs	.90				
Lawns & Landscaping	.25				
Undeveloped	.40				

ASSUMED FUTURE RESIDENTIAL DEVELOPMENT: C = 0.5

RAINFALL INTENSITY:

100 year depth = 2.2 " (Pl. 22.2 D-1)

Intensity Factor = 0.69 (Pl.22.2 D-2)

Intensity = depth x factor I = 1.52 "/hr.

PEAK RUNOFF RATE:

Q = CIA = 0.5 x 1.52 x 231 Q_{100} = 175 cfs

x 0.657 = Q_{10} = 115 cfs

VOLUME OF RUNOFF:

V = C x Rainfall Depth x Area

$$= 0.5 \times \frac{2.2}{12} \times 231 \longrightarrow V_{100} = 21.2 \text{ ac.ft.}$$

x 0.657 = V_{10} = 13.9 ac.ft.

Prepared By: SMM

Date : 5·26·87

(5/86)

HYDROGRAPH COMPUTATION WORKSHEET

DATE 5·26·87
COMPUTED BY SMM
CHECK BY

PROJECT Albuquerque South

LOCATION 1000' North of Improved Amole Channel

ANALYSIS POINT # 2

(DR. AREA) A = 485 ACRES

T_c 95 MIN

POINT RAINFALL 2.2 IN. FROM PLATE 22.2 D-1

CN = 81 FROM PLATES 22.2 C-2, 22.2 C-3

RUNOFF VOLUME R = 0.75 IN. FROM PLATE 22.2 C-4

COMPUTED T_p = 95 MIN. $T_p = T_c$
(Rounded to even minute)

$q_p = \frac{45.4A}{T_p}$ = 232 CFS./INCH OF RUNOFF

$(R \times q_p) = Q_{peak}$ = 174 CFS

t(COLUMN)=(t/T_p) $t=T_p(t/T_p)$

$y = \frac{Q}{Q_{peak}}$ $Q = y(Q_{peak})$

	(t/T_p)	t (min.)	y	Q (cfs)
1	0	0	0	0
2	.1	10	.03	5
3	.2	19	.10	17
4	.3	29	.190	33
5	.4	38	.310	54
6	.5	48	.470	82
7	.6	57	.660	115
8	.7	67	.820	143
9	.8	76	.930	162
10	.9	86	.990	172
11	1.0	95	1.00	174
12	1.1	105	.990	172
13	1.2	114	.930	162
14	1.3	124	.860	150
15	1.4	133	.780	136
16	1.5	143	.680	118
17	1.6	152	.560	97
18	1.7	162	.460	80
19	1.8	171	.390	68
20	1.9	181	.330	57
21	2.0	190	.280	49
22	2.2		.207	
23	2.4		.147	
24	2.6		.107	
25	2.8		.077	
26	3.0	285	.055	10
27	3.2		.040	
28	3.4		.029	
29	3.6		.021	
30	3.8		.015	
31	4.0	380	.011	2
32	4.5		.005	
33	5.0	475	.000	0

PLATE 22.2 F-1

Isaacson & Arfman, P.A.

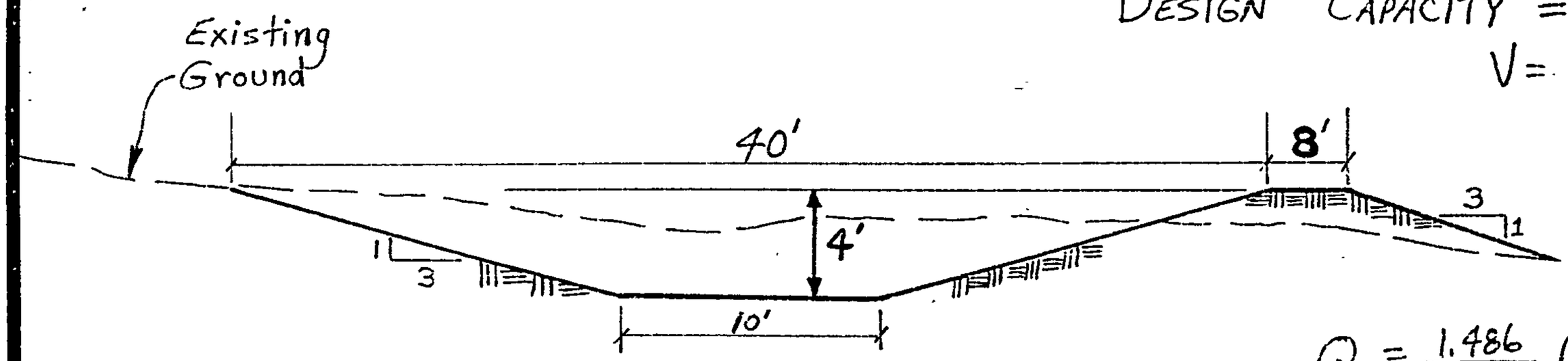
DESIGN CAPACITY = 200 CFS

$V = \frac{1.486}{n} R^{2/3} S^{1/2}$

$n = 0.025$

$S = 0.006\ \%$

$R = \frac{\text{Area}}{\text{Wetted Perimeter}}$



$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$

TEMPORARY DITCH / DIKE
No Scale

ASSUME bottom width (b) = 10', slope (s) = 0.006 ft/ft, & side slope (z) = 3:1

y (ft)	A (ft²)	R	$R^{2/3}$	V (fps)	Comments
2.0	32.00	1.41	1.26	5.80	Q = V·A = (5.8)(32) = 185 cfs
2.1	34.23	1.47	1.29	5.95	Q = (5.95)(34.23) = 203 cfs (OK) > 200 cfs

If ditch depth equals 4.0', then freeboard provided will be 4.0 − 2.1 = 1.9 ft. (2' OK)

CHECK → Velocity = 6 fps < 8 fps ∴ Bank protection not required.

RECEIVED JUL 10 1987 HYDROLOGY SECTION

SUBJECT Ditch / Dike Section JOB NO. 323

BY SMM DATE 5.8.87 SHEET NO. ___ OF ___

Revised 7.9.87 SMM

Isaacson & Arfman, P.A.

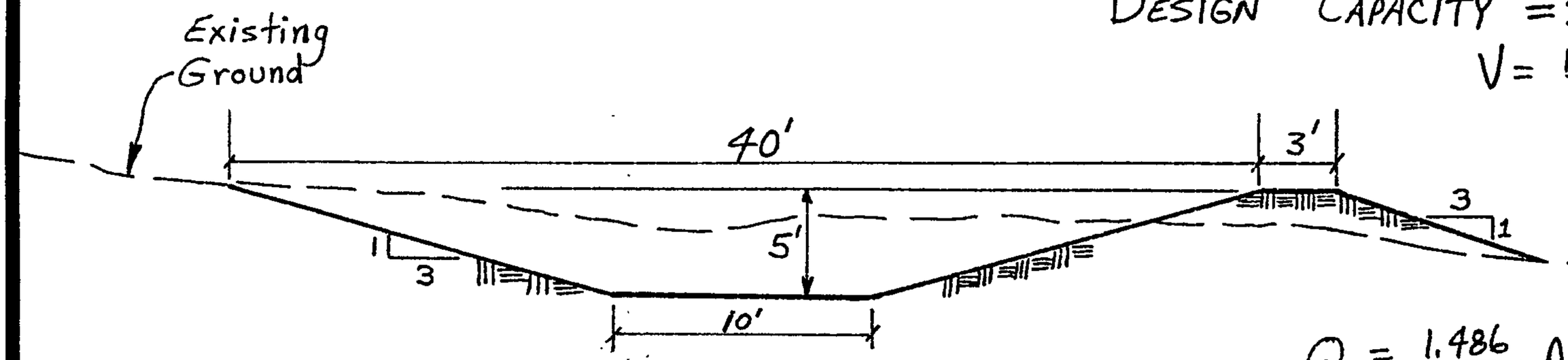
DESIGN CAPACITY = 200 CFS

$V = \frac{1.486}{n} R^{2/3} S^{1/2}$

$n = 0.025$

$S = 0.006$ ft/ft

$R = \frac{\text{Area}}{\text{Wetted Perimeter}}$



$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$

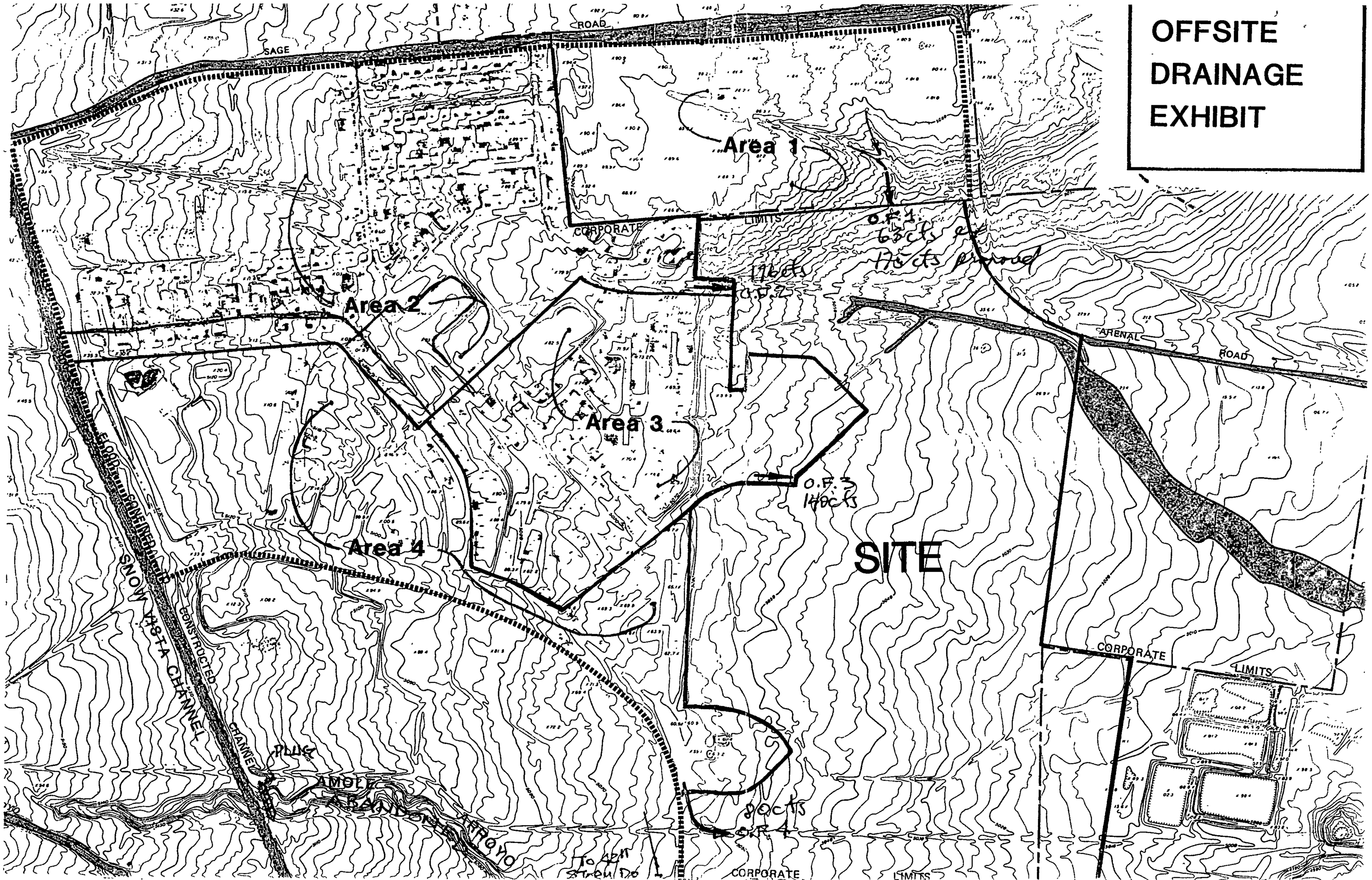
TEMPORARY DITCH / DIKE
No Scale

ASSUME bottom width (b) = 10', slope (s) = 0.006 ft/ft, & side slope (z) = 3:1

y (ft)	A (ft²)	R	$R^{2/3}$	V (fps)	Comments
2.0	32.00	1.41	1.26	5.80	Q = V·A = (5.8)(32) = 185 cfs
2.1	34.23	1.47	1.29	5.95	Q = (5.95)(34.23) = 203 cfs (OK) >200 cfs

If ditch depth equals 5.0', then freeboard provided will be 5.0 − 2.1 = 2.9 ft. (OK)

SUBJECT Ditch / Dike Section JOB NO.
BY SMM DATE 5.8.87 SHEET NO. 23 OF


OFFSITE
DRAINAGE
EXHIBIT
SAGE
ROAD
Area 1
CORPORATE
LIMITS
O.F. 1
63cfs
Area 2
Area 3
ARENAL
ROAD
O.F. 3
140cfs
Area 4
SITE
SNOW VISTA CHANNEL
CONSTRUCTED
CHANNEL
PLUG
ABANDONED
ARROYO
90cfs
O.F. 4
CORPORATE
LIMITS

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

Ken Schultz
Mayor

UTILITY DEVELOPMENT DIVISION
HYDROLOGY SECTION
(505) 768-2650

July 23, 1987

Fred Arfman, P.E.
Isaacson & Arfman, P.A.
128 Monroe, NE
Albuquerque, New Mexico 87108

RE: CONCEPTUAL DRAINAGE PLAN FOR ALBUQUERQUE SOUTH, UNIT 1
RECEIVED JULY 10, 1987 (M-10/D5)

Dear Fred:

The above referenced plan, dated May 27, 1987, is approved for Bulk Land Platting.

Prior to Preliminary Plat approval, we will need a detailed drainage plan.

If you should have any questions, please call me at 768-2650.

Cordially,

Carlos A. Montoya, P.E.
City/County Floodplain Administrator

CAM/bsj

Isaacson &
Arfman, P.A.

Consulting Engineering
Associates

RECEIVED
JUL 10 1987
HYDROLOGY SECTION

July 9, 1987

Carlos Montoya, P.E.
Hydrology Section
City of Albuquerque
P.O. Box 1293
Albuquerque, N.M. 87103

Re: Conceptual Drainage Plan for Albuquerque South,
Unit 1 (M-10/D5)

Dear Carlos:

After reviewing your comments expressed in a June 30, 1987 letter, we are addressing your concerns as follows:

1. A copy of the bulk land plat (currently under review by the DRB), is attached to show the requested dedication of existing floodplain and additional easements provided for future development.

2. A revised ditch/dike section is included which is in conformance with the requirements in Section 22.3 of the DPM.

3. It is my understanding after our conversation on this date, that drainage covenants will be required prior to final subdivision platting, but not for this bulk land platting process.

4. The discrepancy you noted is due to the fact that two different runoff calculation methods were used per DPM criteria. The drainage areas discharging at analysis point 1 and analysis point 2 were both evaluated using the Rational Method, while the SCS Method was used for the entire combined area of approximately 485 acres. The total runoff figure then does not correspond to a direct summing of the two sub-areas.

In response to another concern not listed in your letter, but expressed in our conversation, we are enclosing a copy of the filed offsite drainage easement for the adjacent downstream tract.

If you should have any additional questions, please call me at 268-8828.

Cordially,

Scott M. McGee

Scott M. McGee
SMM/acq
Attachments

128 Monroe, NE • Albuquerque, NM 87108 • (505) 268-8828

DRAINAGE INFORMATION SHEET

PROJECT TITLE: ALBUQUERQUE SOUTH UNIT 1 ZONE ATLAS/DRAINAGE FILE # M-10/D5

LEGAL DESCRIPTION: REMAINDER OF TRACT KK, SECTION 34, T10N, R2E, TOWN OF ATRISCO GRANT

CITY ADDRESS: SW CORNER OF UNSER BLVD & ARENAL ROAD SW

ENGINEERING FIRM: ISAACSON & ARFMAN, P.A. CONTACT: FRED ARFMAN

ADDRESS: 128 MONROE NE PHONE: 268-8828

OWNER: ALBUQUERQUE SOUTH GENERAL PARTNERSHIP CONTACT: RJ SCHAEFER

ADDRESS: 7301 INDIAN SCHOOL · SUITE B PHONE: 883-7666

ARCHITECT: NONE CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: HALL SURVEYING CO. CONTACT: VERLON HALL

ADDRESS: 337 EUBANK NE PHONE: 292-1115

CONTRACTOR: NONE CONTACT: _____

ADDRESS: _____ PHONE: _____

PRE-DESIGN MEETING:

X YES

___ NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

HYDROLOGY SECTION
JUL 10 1987

DRB NO. _____

EPC NO. _____

PROJECT NO. _____

TYPE OF SUBMITTAL:
RESUBMITTAL

___ DRAINAGE REPORT

___ DRAINAGE PLAN

X CONCEPTUAL GRADING & DRAIN PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SECTOR PLAN APPROVAL

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

X OTHER BULK LAND PLAT (SPECIFY).

DATE SUBMITTED: July 10, 1987

BY: Scott M. McGee

REV. 10/85

08772571

RECEIVED
JUL 10 1987
HYDROLOGY SECTION

TEMPORARY EASEMENT

This grant of Temporary Easement, between [state the name of the present real property owner exactly as shown on the real estate document coveying title to the present owner and state the legal status of the owner, for example, "single person," "husband and wife," "corporation of the State of X," "partnership":] Great Western Land Company, a general partnership ("Grantor"), whose address is 7301 Indian School NE, Albuquerque, N.M. 87110, and the City of Albuquerque, a New Mexico municipal corporation ("City"), whose address is P. O. Box 1293, Albuquerque, New Mexico 87103, is made in Albuquerque, Bernalillo County, New Mexico and is entered into as of the date Grantor signs this Temporary Easement.

1. Recital. Grantor is the owner of certain real property located at [give general description, for instance, subdivision, lot and block or street address:] the intersection of Unser Blvd. & Arenal Road SW in Bernalillo County, New Mexico (the "Property").

2. Grant of Easement. The Grantor grants to the City a temporary easement ("Temporary Easement") in, over, upon and across the Property for [state the kind of easement, for example, "public street and highway purposes (including all utilities)," "water line," "sewer line," etc.:] Drainage of Public Stormwaters. The Temporary Easement is more particularly described in the attached Exhibit A. [State on the exhibit either the metes and bounds description of the Temporary Easement or state the exact dimensions and location in a manner which would enable a surveyor to locate the Temporary Easement on the ground.]

The grant of the Temporary Easement includes the right of the City to enter upon the Temporary Easement at any time for inspection, installation, maintenance, repair or modification and the right to remove trees, bushes, undergrowth and any other obstacles if the City determines they interfere with the appropriate use of the Temporary Easement. This grant includes the right of access to the easement across the Grantor's adjoining property.

Grantor agrees for itself and its successors in interest that it has been paid in valuable consideration and that the grant of this Temporary Easement is not a gift or donation.

This Temporary Easement is worded pursuant to the provisions of §§47-1-27 to 47-1-44, NMSA 1978 or successor statutes.

3. Ownership Offer. Grantor states that it is the owner in fee simple of the Property and that it has a good lawful right to convey the Property or any part thereof.

(Approved by Legal Dept.
as to form only-6/15/86)

4. Binding on Grantor's Property. The grant and other provisions of this Temporary Easement constitute covenants running with the land for the benefit of the City and its successors and assigns until terminated.

5. Termination of Temporary Easement. This Temporary Eastment shall remain in effect until [state date of termination or event which will cause Temporary Easement to end:] substitution by an approved permanent easement ("Termination"). Upon Termination and demand by the Grantor the City will execute and deliver to Grantor a release of this Temporary Easement.

6. Indemnification. As a part of the consideration for this grant, subject to the provisions of the New Mexico Tort Claims Act and all other applicable New Mexico laws, the City agrees to save Grantor harmless from any and all liability arising from the City's negligent use of the Temporary Easement for the purposes set forth herein. The City does not agree to save Grantor harmless from any liability which may arise from Grantor's use of the Temporary Easement and the Property.

7. Form Not Changed. Grantor agrees that changes to this form are not binding upon the City unless initialed by the Grantor and approved and signed by the City Legal Deparment in writing on this form.

CITY OF ALBUQUERQUE

Approved:

By: [signature]
Title: CITY ENGINEER
Dated: 7/9/87 CAM

GRANTOR: Great Western Land Co.

By: [signature]
Its: General Partner
Dated: July 8, 1987

STATE OF _____)
) ss
COUNTY OF _____)

The foregoing instrument was acknowledged before me this 8th day of July, 1987, by [name of person signing:] R.J. Schaefer, [title or capacity, for instance, "President" or "Owner":] General Partner of [name of the entity which owns the Property if other than the individual signing, for instance, the name of the corporation, partnership, or joint venture:] Great Western Land Company.

[signature]
Notary Public

OFFICIAL SEAL
KATHERINE M. SCHNIDT
NOTARY PUBLIC - NEW MEXICO
Filed with the Secretary of State
My Commission Expires 3/30/88

My Commission Expires:

(Approved by Legal Dept. as to form only-6/15/86)

(EXHIBIT "A" ATTACHED)

LEGAL DESCRIPTION

Two certain parcels of land situate within projected Section 34, T.10N., R.2E., N.M.P.M., Town of Atrisco Grant, within the City of Albuquerque, Bernalillo County, New Mexico and being contained within the U.S. Home Tract as the same is shown and designated on the plat entitled Valley West, filed in the office of the County Clerk of Bernalillo County, New Mexico, on April 17, 1980 in Book C 16, Page 144 and being more particularly described as follows.

Parcel A: A 50 foot wide easement within the southerly 50 feet of the said Valley West tract between the tract's southwest property corner and the westerly right-of-way of the A.M.A.F.C.A. Parcel A-1-4, said easement having a course of S 81°01'42" E, 1155.53 feet along said common southerly line and containing 57,776 square feet of land (1.3264 acre) more or less.

Parcel B: A 50 foot easement, the centerline of which begins on the westerly property line of the said Valley West tract from whence the northwest corner of said tract bears N 08°49'13" E, 75.00 feet distant; thence S 23°25'35" E, 627.91 feet; thence S 57°30'00" E, 350.00 feet; thence S 51°15'00" E, 430.00 feet to a point on the northwesterly line of A.M.A.F.C.A. Parcel A-1-15 and end of this parcel of land and containing 70,395 square feet of land (1.6161 acres) more or less. The side lines of said easement to be extended or shortened to meet at angle points and terminate at property lines.

Said temporary easements contain a total of 128,171 square feet of land (2.9424 acres) more or less and shall remain in place until said tract is replatted or easement is terminated by a recorded termination agreement.

Bearing Base: The same as shown on the recorded plat of the said Valley West tract.

Thomas O. Isaacson, P.E. & L.S. # 3895 Date 7/8/87
128 Monroe St. NE
Albuquerque, N.M. 87108

STATE OF NEW MEXICO
COUNTY OF BERNALILLO
FILED FOR RECORD

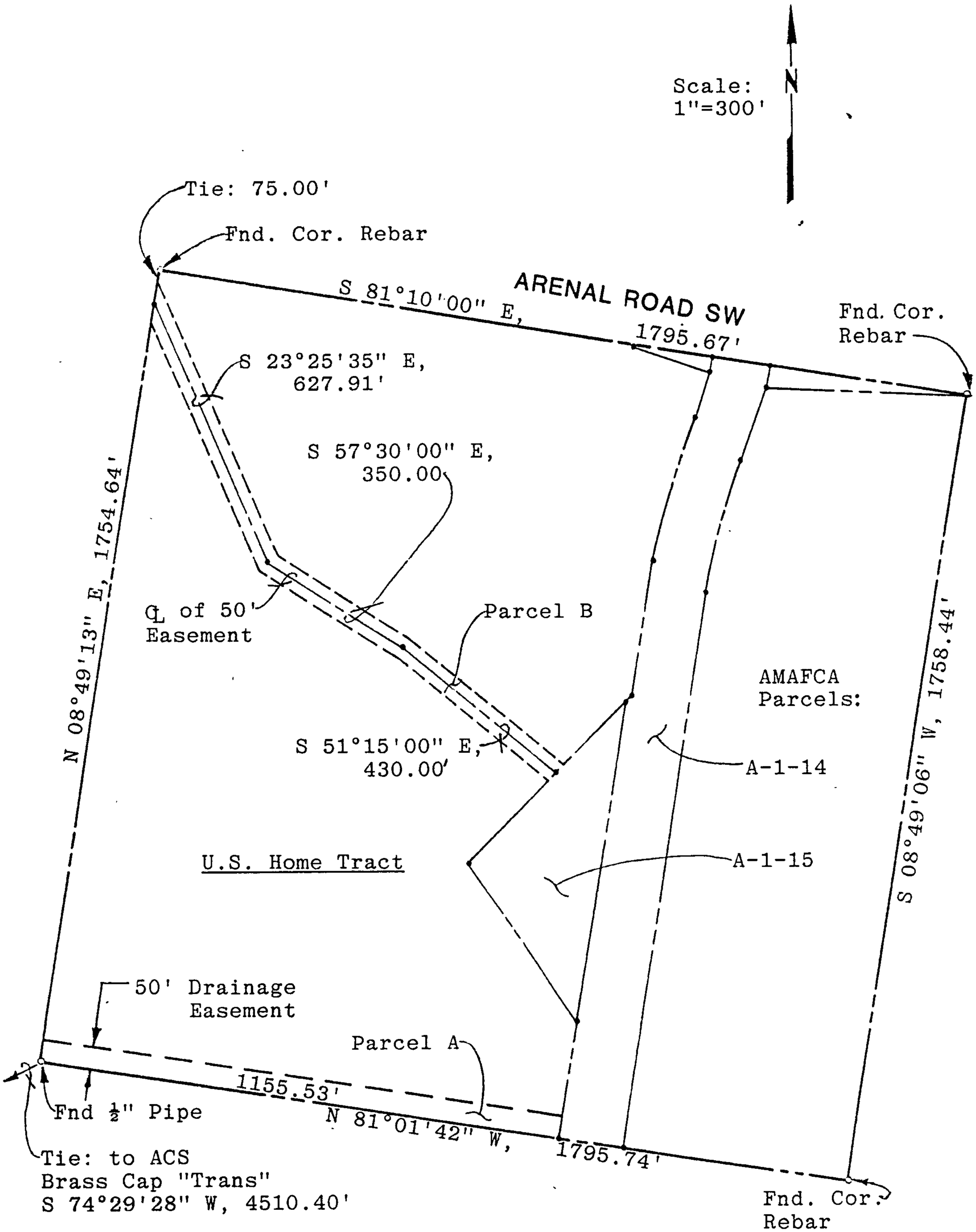
87 JUL 10 PM 3: 13

BK Ms509A PG 241-244
GLADYS M. DAVIS
CO. CLERK & RECORDER
DEPUTY

EXHIBIT 'A'

VALLEY WEST

TEMPORARY DRAINAGE EASEMENT



FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

Ken Schultz
Mayor

UTILITY DEVELOPMENT DIVISION
HYDROLOGY SECTION
(505) 768-2650

June 30, 1987

Fred Arfman, P.E.
Isaacson & Arfman, P.A.
128 Monroe, NE
Albuquerque, New Mexico 87108

RE: CONCEPTUAL DRAINAGE PLAN FOR ALBUQUERQUE SOUTH, UNIT 1
RECEIVED MAY 27, 1987 (M-10/D5)

Dear Fred:

I have reviewed the referenced plan and forward the following comments:

1. Need to dedicate the existing floodplain.

2. Please refer to Section 22.3 (Berms and Levees) in the DPM for criteria concerning the east berm.

3. Drainage covenants will be required at final platting.

4. AP #1 equals 175 cfs and AP #2 equals 174 cfs. However, the ditch/dike section on sheet 23 is a design for only 200 cfs.

If you should have any questions regarding these comments, please call me at 768-2650.

Cordially,

Carlos A. Montoya, P.E.
City/County Floodplain Administrator

CAM/bsj

ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

Albuquerque, NM

CITY OF
Albuquerque

July 25, 1997

Martin J. Chávez, Mayor

Fred C. Arfman, P.E.
Isaacson & Arfman
128 Monroe Street NE
Albuquerque, New Mexico 87108

RE: Master Drainage Report for Desert Flower Subdivision, Units One - Four, (M10/D5) Submitted for Master Plan Approval, Engineer's Stamp Dated 7/3/97.

Dear Mr. Arfman:

Based on the information provided in the submittal of July 3, 1997, the above referenced Master Drainage Plan is acceptable to City Hydrology.

As you are aware, a comprehensive drainage report for each Unit must be submitted to and approved by this office prior to Preliminary Plat approval of each Unit. These drainage reports must be in compliance with this approved Master plan.

Prior to approval of Units Two or Four, the inlet capacity calculations will have to be revised and more inlets may be required.

If you should have any questions regarding these comments, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Bo Johnson, Curb Inc.
File

MASTER DRAINAGE REPORT

FOR

DESERT FLOWER SUBDIVISION
UNITS ONE THROUGH FOUR

A 350 LOT (FOUR PHASE) SINGLE FAMILY RESIDENTIAL SUBDIVISION

ALBUQUERQUE NEW MEXICO
JUNE 1997

RECEIVED
JUL 03 1997
HYDROLOGY SECTION

Prepared by:

ISAACSON & ARFMAN, P.A.
128 Monroe Street, NE
Albuquerque, NM 87108
(505) 268-8828

FRED C. ARFMAN STATE OF NEW MEXICO 7322 REGISTERED PROFESSIONAL ENGINEER

07·03·97

Fred C. Arfman, P.E. **Date**

DRAINAGE INFORMATION SHEET

PROJECT TITLE: DESERT FLOWER MASTER DR. REPORT ZONE ATLAS/DRNG. FILE #: M-10/D5

DRB #: 96-532 EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: TRACT A & B, DESERT FLOWER SUBD.

CITY ADDRESS: N/A.

ENGINEERING FIRM: ISAACSON & ARFMAN, P.A. CONTACT: FRED C. ARFMAN

ADDRESS: 128 MONROE ST. NE PHONE: 268-8828

OWNER: CURB INC. CONTACT: BO JOHNSON

ADDRESS: 6301 INDIAN SCH. RD., STE 680 PHONE: 881-8190

ARCHITECT: N/A. CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: ALDRICH LAND SURVEYING CONTACT: TIM ALDRICH

ADDRESS: P.O. BOX 30701, 87190 PHONE: 884-1990

CONTRACTOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

X DRAINAGE REPORT
___ DRAINAGE PLAN
___ CONCEPTUAL GRADING & DRAINAGE PLAN
___ GRADING PLAN
___ EROSION CONTROL PLAN
___ ENGINEER'S CERTIFICATION
X OTHER MASTER DR. REPORT

PRE-DESIGN MEETING:

___ YES
___ NO
___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL
X PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D. APPROVAL
___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ FOUNDATION PERMIT APPROVAL
___ BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ S.A.D. DRAINAGE REPORT
___ DRAINAGE REQUIREMENTS
X OTHER MASTER DR. REPORT (SPECIFY) APPROVAL

DATE SUBMITTED: 07.03.97

BY: FRED C. ARFMAN

FOR: ISAACSON & ARFMAN, P.A.

RECEIVED
JUL 03 1997
HYDROLOGY SECTION

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Introduction
Vicinity Map
I. Project Information
II. Site Characteristics

Conclusion & Recommendations

Summary Tables

Table 1 - Hydrologic Flow Parameters

Table 2 - Street Flow Characteristics

Table 3 - Storm Inlet Capacities

Table 4 - Storm Sewer Sump Inlet Capacities

Table 5 - Storm Drain Capacities

Appendices

Appendix A: Onsite AHYMO Summary & Detailed Output
100-Year Storm
10-Year Storm

Appendix B: Offsite AHYMO Summary & Detailed Output

Appendix C: Unser Blvd. 10-yr dry lane study

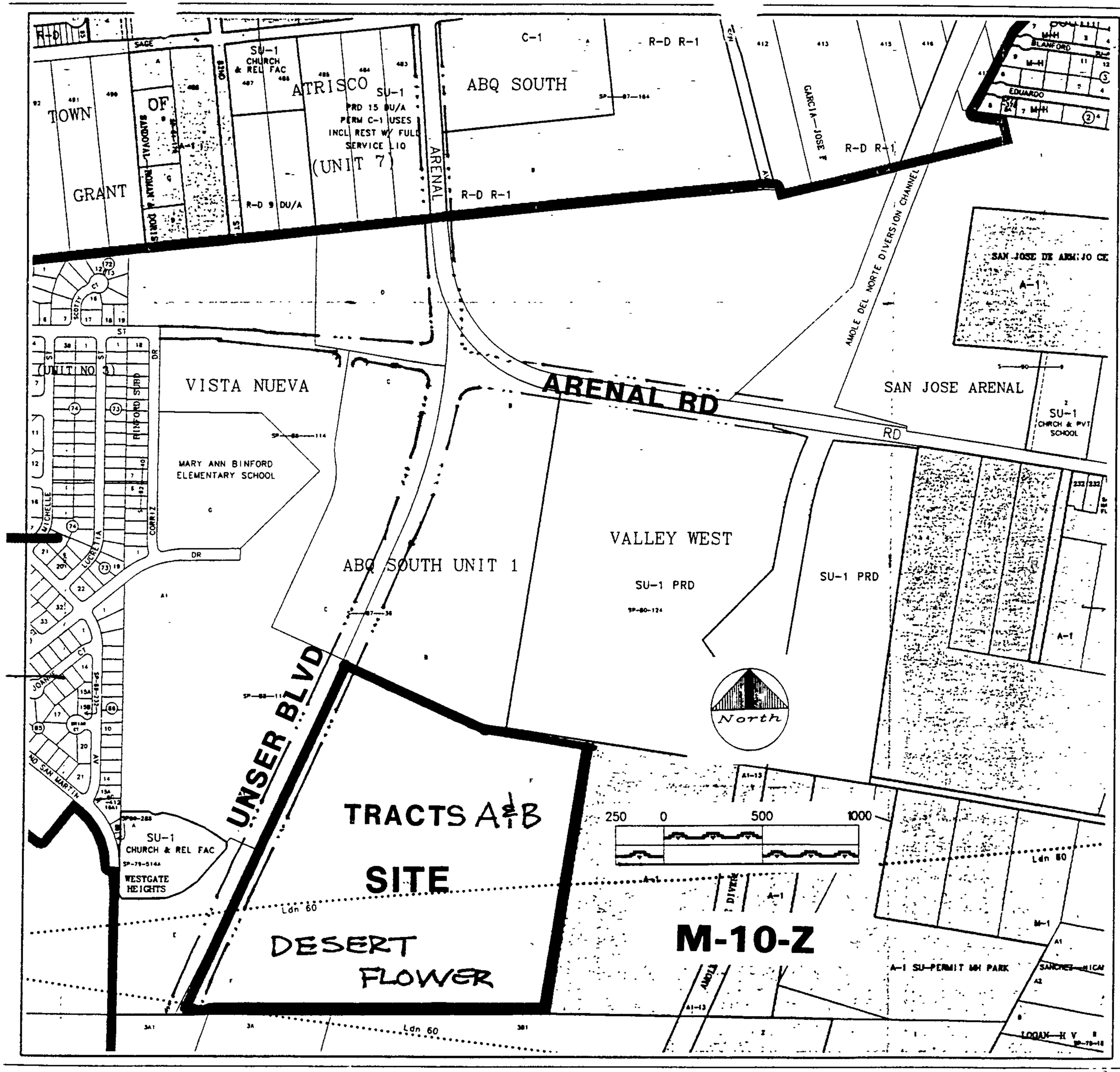
Appendix D: Discharge to the Amole Del Norte Channel(Ref. Arenal/Unser Drainage Management Plan)

Pockets

Figure 1: Master Drainage Plan of June 1997

Figure 2: Offsite Drainage Plan of June 1997

Figure 3: Typical Lot Detail

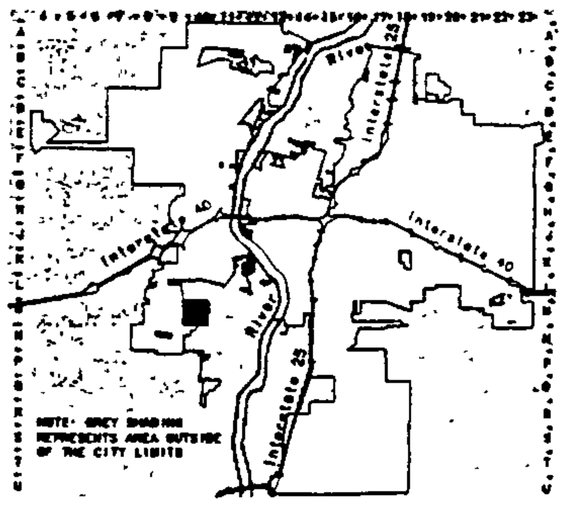


SCALE IN FEET

PHOTOCOPY--NOT TO SCALE

A Automated G Geographic I Information S System

© Planning Department
Map Amended through June 15, 1994



LEGAL DESCRIPTION

T10N

R2E

SEC 34

UNIFORM PROPERTY CODE

1-010-055

INTRODUCTION

The Desert Flower Subdivision development is a masterplan community consisting of multiple phases. The development shall consist of a minimum of four phases, Units One through Four having 84, 76, 91, and 90 single family lots, respectfully. The individual subdivision (Units) of the overall development will be constructed using public utilities, paving, and storm drainage improvements according to the City of Albuquerque Development Standards and Guidelines. This study shall analyze the area wide drainage characteristics as they impact the site and offer solutions and recommendations to solve the hydrological and hydraulic conditions projected to occur in the event of the 100-year storm.

I. PROJECT INFORMATION

LEGAL DESCRIPTION: A parcel of land comprising of Tract F, Albuquerque South, Unit One (August 3, 1987, Volume C34, Folio 74).

ENGINEER: Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
Attn: Fred C. Arfman, P.E.
(505) 268-8828

SURVEYOR: Aldrich Land Surveying, Inc.
Attn: Tim Aldrich, NMPLS No. 7719
(505) 884-1990

BENCHMARK: ACS Monument "1-M10" located at the southeast quadrant of Sage Road and Unser Blvd. SW.
Elevation: 5079.88

ZONING: RLT

NUMBER OF EXISTING TRACTS: 1

NUMBER OF PROPOSED LOTS:
Unit One: 84
Unit Two: 76
Unit Three: 91
Unit Four: 90

TOTAL AREA: 60.28 Ac.
2,625,797 Sq. Ft.

42% D
for 6 units/acre
ok

II. SITE CHARACTERISTICS

FLOOD HAZARD: No part of this development is affected nor contributes to a flood hazard area as determined by Map No. 35001C0336D and 35001C0337D of the September 20, 1996 Edition of the F.E.M.A. Maps.

EXISTING CONDITIONS: This site is currently undeveloped and mostly undisturbed with native ground cover, typical of the City's west side (Land Treatment B). The site has a slope downward toward the east at slopes ranging from 1 to 2 percent. It abuts future Desert Springs Subdivision to the north, Unser Blvd. to the west, and unplatted land to the east and south. Storm water generated from the site flows east onto unplatted land and into the side of the Amole del Norte Channel. Offsite storm waters generated from Unit Two of Sunrise

Estates currently are released to Unser Blvd. and are then conveyed by a combination of street flow and storm drain to an offsite detention pond. Flows are slowly released and are allowed to overland flow on to Basin 406 and 407, and entrance to the side of the Amole del Norte Diversion Channel. Runoff south of the proposed development flows southeast and does not affect the site.

PROPOSED CONDITIONS:

Unit One: This phase will be developed first with 84 lots and will not require storm drain construction. Storm water flows from April Flower Road, Purple Cone Road, and Purple Fringe Road will enter a downstream temporary retention pond capable of accepting the 100-year 10-day volume. Unit One will be required to have the storm drain line from Units 3 and 4 to the Amole del Norte Channel on the required infrastructure list and have a separate S.I.A. and financial guarantee. The offsite storm drain shall be built with the development of the first unit bordering the easterly tract boundary.

Unser Blvd.: Being adjacent and to the west of this phase, Unser Blvd. is included as part of the development and will be analyzed for storm water flow carrying capacity for both the 10-year and 100-year event. A dry lane must be preserved for the 10-year developed runoff.

A storm drain extension on Unser Blvd. from Sunrise Estate Unit 2 to Tract E (Albuquerque South Unit 1) to accept storm waters generated by the street improvement and those generated when Tract E is developed.

Unit Two: The second phase of Desert Flower may either be that portion of Tract B situated in the northeast quadrant or in the southwest quadrant (south of Unit One and adjacent to Unser Blvd.). For this report, the northeast portion of Tract B is assumed as Unit Two. This phase will consist of 76 lots situated to the east of Unit One within the northeast quadrant of the site, and will require the construction of a storm drain near the east end and the previously mentioned offsite storm drain connection to the Amole del Norte Diversion Channel. Retention ponds used to capture Unit One runoffs will be removed. Flows from Unit One will be allowed to enter Unit Two with the continuation of Purple Cone Road and Purple Fringe Road. The flows on these streets which comprise of the runoffs from Unit One and most of the runoffs from Unit Two will enter a battery of inlets at the locations near the intersection with Spring Canyon Drive. The rest of the runoff from Unit Two will flow east on April Flower Place and enter the inlet(s) near the intersection with Spring Canyon Drive. The flows from all the inlets above will enter the storm drain line on Spring Canyon Drive and flow south. This line will discharge the flow into the offsite storm drain and

convey 100% of the storm water flows to the Amole del Norte Diversion Channel.

Unit Three: The development of the 91 lots of this phase will not require storm drain construction. Runoff at the upper end on Native Flower Place will flow onto Spring Flower Place and combine with the runoff on Spring Flower Road. This combined flow will be added to the flow coming down on Purple Rock Place and Desertwood Drive. The total flow will then enter a temporary detention pond in Unit Four.

The southerly portion of Unser Blvd. has a southerly surface drainage pattern. Street flows shall be allowed to enter into a temporary retention pond situated either at the southerly terminus of Unser Blvd. or at the southeast quadrant of Unser Blvd. and Spring Flower Road. Another option is to release the 1.7 cfs flow to the south across the existing public right-of-way of Unser Blvd. to the existing 48" diameter storm drain (approximately 700 feet to the south).

Unit Four: The last phase will have 90 lots and will require the construction of a storm drain from the southwest end to the northeast end. Temporary detention ponds used to capture runoffs from Unit Two and Three will be removed and replaced with storm

drain line and inlets. Two inlets will be placed on Desert Flower Road at the west end of Unit Four. These inlets will take in some of the runoff from Unit Three. The by-pass flow will travel down on Desert Flower Road, then to Cosmos Drive where some of the flow will enter the two inlets near the intersection with Saltbrush Road. The by-pass flow will combine with the flow on Saltbrush Road which make up of the discharges from Desert Spring Drive and Purple Canyon Drive. The total combined flow will enter a battery of inlets at the east end of Unit Four. The storm drain outfall previously constructed will carry the storm water flow to the east and across the undeveloped tract of land and make a side discharge into the Amole del Norte Channel. The storm drain line from Unit 4 to the Amole del Norte Channel shall be in-place as a required infrastructure item of the first phase bordering on the easterly tract line of Tract B, Desert Flower (Bulk Land Plat).

CONCLUSIONS & RECOMMENDATIONS

Desert Flower Units One, Two, Three, and Four are proposed to be developed consecutively. Onsite and offsite runoffs have been addressed as to how the subdivision will have a cohesive drainage solution. Tables 1 thru 4 give more in depth and summarize the fundamentals of concern. Table 1 lists the onsite basins and their discharges, Table 2 shows the street capacity in details

at different locations, Table 3 gives inlet capacity at key points, and Table 4 analyses inlets at sump locations with weir and orifice conditions. The appendices follows the Table section, Appendix A contains the AHYMO printouts for the 100-year and 10-year storm. Summary and detailed outputs are within this section. Appendix B discusses the 10-year dry lane on Unser Blvd., Appendix C contains referencing data from the Arenal/Unser Drainage Management Plan regarding the discharge to the Amole Channel. Pockets at the last part of this report contain master onsite and offsite drainage plans. The recommendations for Units One to Four construction are presented below:

- Retention pond is required at the downstream end of a unit where runoffs will be discharged onto future unit (sized for 100-year 10-day event).
- Retention pond is to be removed and replaced with storm drain system or appropriate rundown when abutting unit is in place.
- Berms or swale points shall be graded around the developing unit so that offsite runoff will not affect this unit.
- Units One and Three lots running parallel to Unser Blvd. shall be graded to match Unser Blvd. future grades.
- The entire reach of the storm drain from Unit Four to the Amole del Norte Channel shall be constructed as part of the Unit Two improvements and should fall within the approved easement. However, this outfall pipe shall be financially guaranteed with Unit One.
- Developer shall construct the storm drain outfall to the Amole del Norte Diversion Channel as a permanent public facility.

- No rear yard ponding shall be allowed in this portion of the development (see Typical Lot Grading Detail, pocket section, figure 4).
- Adjacent lots may share a common lot line drainage swale (see Typical Lot Grading Detail).

DESERT FLOWER SUBDIVISION, UNIT ONE

RE: STORM WATER RETENTION PONDS (TEMPORARY)

1. UNIT ONE (100 YR. EVENT): BASINS 108, 109, 110

DATA: V_{360} = 1.53 AC-FT = 66,647 CU. FT. (AHYMO)

$V_{10\ DAT} = V_{360} + A_D(P_{10\ DAT} - P_{360})/12$ IN.

$= 66{,}647 + (14.41\ AC \times 43560 \times 0.42)(3.67 - 2.2)/12$ IN

$= 66{,}647 + (627{,}700 \times 0.42)(1.47)/12$ IN

$= 66{,}647 + 32{,}295$

$= \underline{\underline{98{,}942}}$ CU. FT.

2. UNIT THREE (100 YR. EVENT)

DATA: V_{360} = 78,125 CU. FT.

BASINS: 100, 101, 102 & 103 (17.41 AC.)

$V_{10\ DAT} = 78{,}125 + A_D(P_{10D} - P_{360})/12$ IN

= 117,144 CU. FT. (USING SAME METHODOLOGY AS ABOVE)

3. UNIT THREE (100 YR. EVENT): LINSER BLVD. POND

DATA: AREA = 0.467 AC. (21,351 S.F.)

V_{360} = 1536 CU. FT.

D = 0.60

$V_{10\ DAT} = 1536 + A_D(P_{10D} - P_{360})/12$ IN.

= 3032 CU. FT.

ISAACSON & ARFMAN, P.A.

DESERT FLOWER SUBD.

SUBJECT RETENTION PONDS JOB NO.

BY FCA DATE 07/97 SHEET NO. 1 OF 1

DESERT FLOWER SUBDIVISION, UNIT ONE

RE: STORM WATER RETENTION PONDS (TEMPORARY)

1. UNIT ONE (100 YR. EVENT): BASINS 108, 109, 110

DATA: V_{360} = 1.53 AC-FT = 66,647 CU. FT. (ARMYMO)

$V_{10\ DAY} = V_{360} + A_D(P_{10\ DAY} - P_{360})/12$ IN.

$= 66,647 + (14.41\ AC \times 43560 \times 0.42)(3.67 - 2.2)/12$ IN

$= 66,647 + (627,700 \times 0.42)(1.47)/12$ IN

$= 66,647 + 32,295$

$= \underline{\underline{98,942}}$ CU. FT.

2. UNIT THREE (100 YR. EVENT)

DATA: V_{360} = 78,125 CU. FT.

BASINS: 100, 101, 102 & 103 (17.41 AC.)

$V_{10\ DAY} = 78,125 + A_D(P_{10D} - P_{360})/12$ IN

= 117,144 CU. FT. (USING SAME METHODOLOGY AS ABOVE)

3. UNIT THREE (100 YR. EVENT): LINSER BLVD. POND

DATA: AREA = 0.467 AC. (21,351 S.F.)

V_{360} = 1536 CU. FT.

D = 0.60

$V_{10\ DAY} = 1536 + A_D(P_{10D} - P_{360})/12$ IN.

= 3032 CU. FT.

ISAACSON & ARFMAN, P.A.

DESERT FLOWER SUBD.

SUBJECT RETENTION PONDS JOB NO.

BY FCA DATE 07/97 SHEET NO. 1 OF 1

SUMMARY TABLES

TABLE 1
ONSITE BASIN SUMMARY

Basin ID	Area (Sq. Mi.)	Contributing Basins	Cummulative Area (Sq. Mi.)	% A	% B	% C	% D	Basin Q (cfs)	Cummulative Q (cfs)
100	0.00608	100	0.00608	0	29	29	42	12.7	12.7
101	0.00432	100,101	0.0104	0	29	29	42	9.0	21.7
102	0.00728	101*,102	0.01768	0	29	29	42	15.2	36.9
103	0.00953	102*,103	0.02721	0	29	29	42	19.8	56.7
104	0.00470	103*,104	0.03191	0	29	29	42	9.8	66.5
105	0.00503	104*,105	0.03694	0	29	29	42	10.5	77.0
106	0.00390	105*,106	0.04084	0	29	29	42	8.1	85.1
107	0.00623	106*,107	0.04707	0	29	29	42	13.0	98.1
108	0.00738	108	0.00738	0	29	29	42	15.4	15.4
109	0.00672	108,109	0.0141	0	29	29	42	14.0	29.4
110	0.00844	109*,110	0.02254	0	29	29	42	17.6	47.0
111	0.00315	110*,111	0.02569	33	19	19	29	5.2	52.2
112	0.00292	111*,112	0.02861	0	29	29	42	6.1	58.3
113	0.00627	112*,113	0.03488	0	29	29	42	13.0	71.3
114	0.00737	107*,113*,114	0.08932	0	29	29	42	15.3	184.7

*Cumulative Q of basin

TABLE 2
FLOW CHARACTERISTICS AT KEY LOCATIONS

	STREET	LOCATION (STA)	ST. WIDTH & CURB TYPE	% SLOPE	Q100 (cfs)	Dn	Dc	Vn	Vc	AREA	TOP WIDTH	EG	F	*POOL DEPT
Unit 1	April Flower Road	@ Spring Dr. Int.	28′ Mount	1.5	15.4	0.33	0.37	3.19	2.60	4.83	29.25	0.49	1.38	0.50
Unit 1	Purple Cone Road	@ Spring Dr. Int.	28′ Mount	2.5	14.0	0.30	0.36	3.62	2.52	3.87	28.96	0.50	1.74	0.48
Unit 1	Purple Fringe Road	@ Spring Dr. Int.	32′ Mount	2.8	17.6	0.32	0.39	3.97	2.60	4.43	31.01	0.56	1.91	0.52
Unit 1	Spring Drive	@ Flax Rd. Int.	32′ Stand	1.5	16.0	0.40	0.43	3.15	2.57	5.07	31.38	0.55	1.40	0.56
Unit 2	April Flower Place	@ Spring Canyon Dr. Int.	28′ Mount	1.8	11.3	0.31	0.35	3.14	2.44	4.04	29.02	0.46	1.48	0.47
Unit 2	Purple Cone Road	@ Spring Dr. Int.	28′ Stand	1.4	29.4	0.47	0.54	4.09	3.25	7.19	28.24	0.73	1.43	0.75
Unit 2	Purple Cone Road	@ Lots 8 and 13	28′ Stand	1.4	35.9	0.51	0.59	4.42	3.44	8.12	28.26	0.81	1.45	0.82
Unit 2	Purple Cone Road	@ Spring Canyon Dr. Int.	28′ Stand	1.4	42.4	0.54	0.63	4.72	3.67	8.98	28.27	0.88	1.48	0.89
Unit 2	Purple Fringe Road	@ Spring Dr. Int.	32′ Stand	1.6	32.9	0.48	0.56	4.23	3.23	7.77	32.24	0.76	1.52	0.76
	Desert Flower Pl.	@ Desert Flower Rd. Int.	28′ Stand	0.6	12.7	0.40	0.40	2.44	2.27	5.20	28.20	0.50	1.00	0.50
	Desert Flower Road	@ Purple Rock Pl. Int.	32′ Stand	1.8	21.7	0.42	0.48	3.72	2.80	5.83	32.21	0.64	1.54	0.63
	Desert Flower Road	@ West Desert-wood Dr. Int.	32′ Stand	1.8	36.9	0.49	0.58	4.59	3.33	8.04	32.25	0.82	1.62	0.80

TABLE 2 (CONTINUED)
FLOW CHARACTERISTICS AT KEY LOCATIONS

	STREET	LOCATION (STA)	ST. WIDTH & CURB TYPE	% SLOPE	Q100 (cfs)	Dn	Dc	Vn	Vc	AREA	TOP WIDTH	EG	F	*POOL DEPT
Unit 3	Desert Flower Road	@ East Desert-wood Dr. Int.	32′ Stand	1.8	54.7	0.56	0.68	5.35	3.82	10.21	32.28	1.00	1.68	0.96
Unit 3	Purple Rock Place	@ Desert Flower Rd. Int.	28′ Stand	0.7	15.2	0.42	0.42	2.63	2.55	5.77	28.21	0.53	1.03	0.55
Unit 3	Desertwood Drive	@ Lots 11 & 16	28′ Mount	0.8	10.0	0.32	0.32	2.26	2.23	4.42	29.14	0.40	1.02	0.42
Unit 3	Desertwood Drive	@ Desert Flower Rd. Int.	28′ Stand	0.8	19.8	0.46	0.47	2.95	2.84	6.71	28.23	0.59	1.07	0.63
Unit 4	Saltbrush Road	@ West Purple Canyon Dr. Int.	28′ Mount	1.8	10.5	0.29	0.32	2.97	2.29	3.54	27.67	0.42	1.49	0.42
Unit 4	Saltbrush Road	@ East Purple Canyon Dr. Int.	28′ Stand	1.8	18.6	0.40	0.45	3.68	2.79	5.05	28.20	0.61	1.53	0.60
Unit 4	Desert Flower Road	@ East Purple Cayon Dr. Int.	28′ Stand	1.84	44.5	0.52	0.64	5.23	3.73	8.51	28.26	0.94	1.68	0.91
Unit 4	Cosmos Drive	@ Salt-brush Rd. Int.	28′ Stand	1.0	54.3	0.63	0.70	4.73	3.97	11.79	28.32	0.97	1.31	1.01
Unit 4	Saltbrush Road	@ East Cosmos Dr. Int.	28′ Stand	1.8	50.5	0.54	0.67	5.37	3.83	9.03	28.27	0.99	1.68	0.95

*POOL DEPTH = Dc + (1.25Vc^2)/(2g)

TABLE 3
INLETS CAPACITY AT KEY LOCATIONS

INLET NO.	INLET TYPE	STREET	LOCATION (STA)	ST. WIDTH & CURB TYPE	% SLOPE	Q100	Dn (ft)	Qintercepted (cfs)	Qby-pass (cfs)
6 & 7	C	Desert Flower Road	@ Desertwood Dr. Int.	32' Stand	1.84	56.7	0.56	22	34.7
8 & 9	C	Cosmos Drive	@ Saltbrush Rd. Int.	28' Stand	1.0	54.3	0.63	20.4	33.9

TABLE 4
SUMMARY OF STORM SEWER ~~SUMP~~ INLET CAPACITIES

INLET NO.	INLET TYPE (*)	STREET	LOCATION (STA)	Q100 (cfs)	Hweir (ft)	Weir Length (ft)	Qweir (cfs)	Qweir w/ Clogging Factor (cfs)	Horifice (ft)	Area (sq.ft.)	Qorifice (cfs)	Qorifice w/Clogging Factor (cfs)
1	2	April Flower Place	@ Spring Canyon Dr.	11.3	0.87	13.75	23.3	20.97	1	8.2	42.78	25.67
2 & 3	2	Purple Cone Road	@ Spring Canyon Dr.	42.4	0.87	27.5	46.6	41.94	1	16.4	85.55	51.33
4 & 5	2	Purple Fringe Road	@ Spring Canyon Dr.	32.9	0.87	27.5	46.6	41.94	1	16.4	85.55	51.33
10 & 11	2	Saltbrush Road	@ Cosmos Drive	50.5	0.87	27.5	46.6	41.94	1	16.4	85.55	51.33

Qweir = CLH^1.5 clog factor = 0.9
Qorifice = CA (2gH)^.5 clog factor = 0.6

*1 Double Grate Type "A" Inlet (COA)
2 Double Grate Type "C" Inlet (COA)

TABLE 5
STORM DRAIN CAPACITY

STREET	LOCATION (STA)	SLOPE (%)	PIPE SIZE (in)	DESIGN Q (cfs)	VELOCITIES (fps)	MAXIMUM PIPE CAPACITY (cfs)
April Flower	@ Spring Canyon Dr.	1.8	18"	11.3	8.0	14.1
Purple Cone	@ Spring Canyon Dr.	1.4	30"	42.2	9.9	48.5
Purple Fringe Rd.	@ Spring Canyon Dr.	2.2	24"	32.9	10.7	33.5
Spring Flower Rd.	Spring Flower Rd.	1.84	24"	22.0	9.8	30.7
Cosmo Dr.	Cosmo Dr.	1.0	24"	22.0	7.2	22.6
Cosmo Dr.	@ Saltbrush Rd.	1.1	30"	42.4	8.8	43.0
Saltbrush Rd.	E. Cosmo Dr.	1.8	30"	42.4	11.2	55.0
Saltbrush Rd.	W. Spring Canyon Dr.	1.8	42"	92.9	14.0	135.0
Saltbrush Rd.	E. Spring Canyon Dr.	1.8	54"	179.5	16.6	263.9
Spring Canyon Dr.	April Flower to Purple Cone Rd.	0.6	24"	11.3	5.6	17.5
Spring Canyon Dr.	Purple Cone Rd. to Purple Fringe Rd.	0.7	36"	53.7	7.9	55.8
Spring Canyon Dr.	Purple Fringe Rd. to Saltbrush Rd.	0.8	42"	86.6	9.4	90.0

APPENDIX A

ONSITE AHYMO SUMMARY & DETAILED OUTPUT
100-YEAR STORM
10-YEAR STORM

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =06/30/1997
INPUT FILE = DESRT100.DAT USER NO.= ISCARFNM.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1 NOTATION
*S	DESERT FLOWER SUBDIVISION - 100 YR POST DEVELOPMENT									
*S	DESRT100.DAT									
*S	REVISED BY: JMN 6/27/97									
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.200
*S BASIN 100: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	100.00	-	1	.00608	12.66	.421	1.29860	1.500	3.253	PER IMP= 42.00
*S BASIN 101: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	101.00	-	2	.00432	9.00	.299	1.29860	1.500	3.255	PER IMP= 42.00
*S COMBINE BASINS 100 AND 101 TOGETHER										
ADD HYD	101.10	1& 2	3	.01040	21.66	.720	1.29854	1.500	3.254	
*S BASIN 102: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	102.00	-	4	.00728	15.16	.504	1.29860	1.500	3.252	PER IMP= 42.00
*S COMBINE BASIN 102 TO HYDROGRAPH NO 101.1										
ADD HYD	102.10	3& 4	5	.01769	36.82	1.225	1.29855	1.500	3.253	
*S BASIN 103: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	103.00	-	6	.00953	19.83	.660	1.29860	1.500	3.251	PER IMP= 42.00
*S COMBINE BASINS 103 AND HYDROGRAPH NO. 102.1 TOGETHER										
ADD HYD	103.10	5& 6	7	.02722	56.65	1.885	1.29855	1.500	3.252	
*S BASIN 104: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	140.00	-	8	.00470	9.79	.325	1.29860	1.500	3.254	PER IMP= 42.00
*S COMBINE BASIN 104 AND HYDROGRAPH 103.1 TOGETHER										
ADD HYD	104.10	7& 8	9	.03191	66.44	2.210	1.29855	1.500	3.253	
*S BASIN 105: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	105.00	-	10	.00503	10.47	.348	1.29860	1.500	3.254	PER IMP= 42.00
*S BASIN 106: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	106.10	-	11	.00390	8.13	.270	1.29860	1.500	3.255	PER IMP= 42.00
*S COMBINE BASINS 106 AND 105 TOGETHER										
ADD HYD	106.10	10&11	12	.00893	18.60	.618	1.29853	1.500	3.254	
*S BASIN 107: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	107.00	-	13	.00623	12.98	.432	1.29860	1.500	3.253	PER IMP= 42.00
*S COMBINE BASIN 107 AND HYDROGRAPH NO 104.1 TOGETHER										
ADD HYD	107.10	13& 9	14	.03815	79.42	2.642	1.29855	1.500	3.253	
*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER										
ADD HYD	107.20	12&14	15	.04708	98.01	3.260	1.29855	1.500	3.253	
*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER										
ADD HYD	107.20	12&14	15	.04708	98.01	3.260	1.29855	1.500	3.253	
*S BASIN 108: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	108.00	-	16	.00738	15.37	.511	1.29860	1.500	3.252	PER IMP= 42.00
*S BASIN 109: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	109.00	-	17	.00672	13.99	.465	1.29860	1.500	3.252	PER IMP= 42.00
*S COMBINE BASINS 108 AND 109 TOGETHER										
ADD HYD	109.10	16&17	18	.01410	29.36	.977	1.29855	1.500	3.252	
*S BASIN 110: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	110.00	-	19	.00844	17.56	.584	1.29860	1.500	3.252	PER IMP= 42.00
*S BASIN 111: PARK										
COMPUTE NM HYD	111.00	-	20	.00315	5.20	.169	1.00753	1.500	2.579	PER IMP= 29.00
*S BASIN 112: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	112.00	-	1	.00292	6.08	.202	1.29860	1.500	3.257	PER IMP= 42.00
*S COMBINE BASINS 111 AND 112 TOGETHER										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	112.10	20& 1	2	.00606	11.27	.371	1.14736	1.500	2.905	
*S BASIN 113: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	113.00	-	3	.00627	13.04	.434	1.29860	1.500	3.253	PER IMP= 42.00
*S COMBINE BASINS 113 AND 118 TOGETHER										
ADD HYD	113.10	3&18	4	.02037	42.40	1.411	1.29855	1.500	3.252	
*S COMBINE BASINS 113 AND 118 TOGETHER										
ADD HYD	113.20	3&18	5	.02037	42.40	1.411	1.29855	1.500	3.252	
*S BASIN 114: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	114.00	-	6	.00737	15.34	.510	1.29860	1.500	3.252	PER IMP= 42.00
*S COMBINE BASINS 110 AND 114 TOGETHER										
ADD HYD	114.10	19& 6	7	.01581	32.90	1.095	1.29856	1.500	3.252	
*S COMBINE HYDROGRAPH NO 113.2 AND 114.1 TOGETHER										
ADD HYD	114.20	5& 7	8	.03617	75.29	2.505	1.29856	1.500	3.252	
*S COMBINE HYDROGRAPH NO 107.2 AND 114.2 TOGETHER										
ADD HYD	114.30	15& 8	9	.08325	173.31	5.766	1.29855	1.500	3.253	
*S BASIN 120.1: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)										
COMPUTE NM HYD	120.10	-	10	.00073	1.70	.059	1.50556	1.500	3.630	PER IMP= 60.00
*S BASIN 120.2: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)										
COMPUTE NM HYD	120.20	-	11	.00281	6.49	.226	1.50556	1.500	3.606	PER IMP= 60.00
*S BASIN 120.3: OFFSITE: UNSER BLVD. MEDIAN AREA										
COMPUTE NM HYD	120.30	-	12	.00215	4.96	.172	1.50556	1.500	3.608	PER IMP= 60.00
FINISH										

```
AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 06/30/1997
     START TIME (HR:MIN:SEC) = 13:21:32      USER NO.= ISCARFNM.I01
     INPUT FILE = DESRT100.DAT

*S                DESERT FLOWER SUBDIVISION - 100 YR POST DEVELOPMENT
*S                DESRT100.DAT
*S                REVISED BY: JMN 6/27/97
*
START             RAINFALL BEGINS AT 0.0 HRS
RAINFALL          TYPE=1 RAIN QUARTER=0 RAIN ONE=1.87
                  RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333HR

            COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
            DT =    .033330 HOURS        END TIME =     5.999400 HOURS
               .0000   .0016   .0033   .0050   .0067   .0085   .0103
               .0122   .0141   .0160   .0180   .0201   .0222   .0243
               .0266   .0289   .0312   .0337   .0362   .0388   .0415
               .0443   .0472   .0502   .0534   .0567   .0601   .0637
               .0675   .0715   .0758   .0809   .0865   .0924   .1050
               .1334   .1771   .2398   .3254   .4379   .5814   .7600
               .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
              1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
              1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
              1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
              1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
              2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
              2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
              2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
              2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
              2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
              2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  2.1159
              2.1176  2.1193  2.1210  2.1227  2.1244  2.1260  2.1276
              2.1292  2.1308  2.1324  2.1340  2.1355  2.1371  2.1386
              2.1401  2.1416  2.1431  2.1446  2.1460  2.1475  2.1489
              2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
              2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
              2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
              2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
              2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
              2.1944  2.1956  2.1967  2.1978  2.1989  2.2000

*S BASIN 100: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=1 HYD NO=100.00 AREA=0.00608 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

   K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   10.082    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 = 1.8700
   AREA =      .002554 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


   K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
   UNIT PEAK =   9.3826    CFS   UNIT VOLUME =    .9991       B =   354.67      P60 = 1.8700
   AREA =      .003526 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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```
PRINT HYD            ID=1   CODE=1

                                   PARTIAL HYDROGRAPH   100.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .4211 ACRE-FEET
    PEAK DISCHARGE RATE =       12.66 CFS  AT   1.500 HOURS   BASIN AREA =   .0061 SQ. MI.


*S BASIN 101: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=2 HYD NO=101.00 AREA=0.004321 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.1650    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
    AREA =      .001815 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   6.6681    CFS   UNIT VOLUME =    .9984       B =   354.67      P60 = 1.8700
    AREA =      .002506 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=2   CODE=1

                                   PARTIAL HYDROGRAPH   101.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .2993 ACRE-FEET
    PEAK DISCHARGE RATE =        9.00 CFS  AT   1.500 HOURS   BASIN AREA =   .0043 SQ. MI.


*S COMBINE BASINS 100 AND 101 TOGETHER
ADD HYD              ID=3  HYD NO=101.1  ID=1  ID=2
PRINT HYD            ID=3  CODE=1

                                   PARTIAL HYDROGRAPH   101.10

    RUNOFF VOLUME =      1.29854 INCHES      =         .7203 ACRE-FEET
    PEAK DISCHARGE RATE =       21.66 CFS  AT   1.500 HOURS   BASIN AREA =   .0104 SQ. MI.


*S BASIN 102: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=4 HYD NO=102.00 AREA=0.007284 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   12.078    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .003059 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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```
    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   11.241    CFS   UNIT VOLUME =    .9993       B =   354.67      P60 = 1.8700
    AREA =       .004225 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=4   CODE=1

                                  PARTIAL HYDROGRAPH   102.00

    RUNOFF VOLUME =     1.29860 INCHES     =        .5045 ACRE-FEET
    PEAK DISCHARGE RATE =      15.16 CFS  AT   1.500 HOURS   BASIN AREA =   .0073 SQ. MI.


*S COMBINE BASIN 102 TO HYDROGRAPH NO 101.1
ADD HYD             ID=5  HYD NO=102.1  ID=3  ID=4
PRINT HYD           ID=5  CODE=1

                                  PARTIAL HYDROGRAPH   102.10

    RUNOFF VOLUME =     1.29855 INCHES     =       1.2248 ACRE-FEET
    PEAK DISCHARGE RATE =      36.82 CFS  AT   1.500 HOURS   BASIN AREA =   .0177 SQ. MI.


*S BASIN 103: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=6 HYD NO=103.00 AREA=0.00953 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   15.802    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 = 1.8700
    AREA =       .004003 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   14.707    CFS   UNIT VOLUME =    .9995       B =   354.67      P60 = 1.8700
    AREA =       .005527 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=6   CODE=1

                                  PARTIAL HYDROGRAPH   103.00

    RUNOFF VOLUME =     1.29860 INCHES     =        .6600 ACRE-FEET
    PEAK DISCHARGE RATE =      19.83 CFS  AT   1.500 HOURS   BASIN AREA =   .0095 SQ. MI.


*S COMBINE BASINS 103 AND HYDROGRAPH NO. 102.1 TOGETHER
ADD HYD             ID=7  HYD NO=103.1 ID=5  ID=6
PRINT HYD           ID=7  CODE=1

                                  PARTIAL HYDROGRAPH   103.10
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    RUNOFF VOLUME =      1.29855 INCHES      =        1.8848 ACRE-FEET
    PEAK DISCHARGE RATE =       56.65 CFS  AT   1.500 HOURS   BASIN AREA =   .0272 SQ. MI.


*S BASIN 104: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=8 HYD NO=140.00 AREA=0.004699 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.7918    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
    AREA =      .001974 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   7.2515    CFS   UNIT VOLUME =    .9986       B =   354.67      P60 = 1.8700
    AREA =      .002725 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=8   CODE=1

                                PARTIAL HYDROGRAPH   140.00


    RUNOFF VOLUME =      1.29860 INCHES      =         .3254 ACRE-FEET
    PEAK DISCHARGE RATE =        9.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0047 SQ. MI.


*S COMBINE BASIN 104 AND HYDROGRAPH 103.1 TOGETHER
ADD HYD              ID=9  HYD NO=104.1  ID=7  ID=8
PRINT HYD            ID=9  CODE=1

                                PARTIAL HYDROGRAPH   104.10


    RUNOFF VOLUME =      1.29855 INCHES      =        2.2102 ACRE-FEET
    PEAK DISCHARGE RATE =       66.44 CFS  AT   1.500 HOURS   BASIN AREA =   .0319 SQ. MI.


*S BASIN 105: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=10  HYD NO=105.00 AREA=0.00503 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   8.3407    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.8700
    AREA =      .002113 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   7.7623    CFS   UNIT VOLUME =    .9988       B =   354.67      P60 = 1.8700
    AREA =      .002917 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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PRINT HYD            ID=10  CODE=1

                                PARTIAL HYDROGRAPH   105.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .3484 ACRE-FEET
    PEAK DISCHARGE RATE =      10.47 CFS  AT   1.500 HOURS   BASIN AREA =   .0050 SQ. MI.


*S BASIN 106: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=11  HYD NO=106.10 AREA=0.0039 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.4669    CFS   UNIT VOLUME =    .9976       B =   526.28      P60 = 1.8700
    AREA =      .001638 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   6.0185    CFS   UNIT VOLUME =    .9982       B =   354.67      P60 = 1.8700
    AREA =      .002262 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=11   CODE=1

                                PARTIAL HYDROGRAPH   106.10

    RUNOFF VOLUME =      1.29860 INCHES      =         .2701 ACRE-FEET
    PEAK DISCHARGE RATE =       8.13 CFS  AT   1.500 HOURS   BASIN AREA =   .0039 SQ. MI.


*S COMBINE BASINS 106 AND 105 TOGETHER
ADD HYD              ID=12  HYD NO=106.1  ID=10  ID=11
PRINT HYD            ID=12  CODE=1

                                PARTIAL HYDROGRAPH   106.10

    RUNOFF VOLUME =      1.29853 INCHES      =         .6184 ACRE-FEET
    PEAK DISCHARGE RATE =      18.60 CFS  AT   1.500 HOURS   BASIN AREA =   .0089 SQ. MI.


*S BASIN 107: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=13  HYD NO=107.0  AREA=0.006234 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.337    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 = 1.8700
    AREA =      .002618 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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    K =    .118429HR     TP =    .133300HR     K/TP RATIO =    .888442      SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    9.6203     CFS    UNIT VOLUME =     .9991        B =    354.67       P60 = 1.8700
    AREA =       .003616 SQ MI     IA =     .42500 INCHES     INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=13  CODE=1

                                   PARTIAL HYDROGRAPH    107.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .4318 ACRE-FEET
    PEAK DISCHARGE RATE =       12.98 CFS  AT    1.500 HOURS    BASIN AREA =    .0062 SQ. MI.


*S COMBINE BASIN 107 AND HYDROGRAPH NO 104.1 TOGETHER
ADD HYD              ID=14  HYD NO=107.1  ID=13  ID=9
PRINT HYD            ID=14  CODE=1

                                   PARTIAL HYDROGRAPH    107.10

    RUNOFF VOLUME =      1.29855 INCHES      =        2.6420 ACRE-FEET
    PEAK DISCHARGE RATE =       79.42 CFS  AT    1.500 HOURS    BASIN AREA =    .0381 SQ. MI.


*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER
ADD HYD              ID=15  HYD NO=107.2  ID=12  ID=14
PRINT HYD            ID=15  CODE=1

                                   PARTIAL HYDROGRAPH    107.20

    RUNOFF VOLUME =      1.29855 INCHES      =        3.2604 ACRE-FEET
    PEAK DISCHARGE RATE =       98.01 CFS  AT    1.500 HOURS    BASIN AREA =    .0471 SQ. MI.


*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER
ADD HYD              ID=15  HYD NO=107.2  ID=12  ID=14
PRINT HYD            ID=15  CODE=1

                                   PARTIAL HYDROGRAPH    107.20

    RUNOFF VOLUME =      1.29855 INCHES      =        3.2604 ACRE-FEET
    PEAK DISCHARGE RATE =       98.01 CFS  AT    1.500 HOURS    BASIN AREA =    .0471 SQ. MI.


*S BASIN 108: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=16  HYD NO=108.0  AREA=0.007383 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    12.242     CFS    UNIT VOLUME =     .9984        B =    526.28       P60 = 1.8700
    AREA =       .003101 SQ MI     IA =     .10000 INCHES     INF =    .04000 INCHES PER HOUR
```

```
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   11.393    CFS   UNIT VOLUME =    .9993       B =   354.67      P60 = 1.8700
    AREA =      .004282 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=16  CODE=1

                                PARTIAL HYDROGRAPH   108.00

    RUNOFF VOLUME =    1.29860 INCHES     =        .5113 ACRE-FEET
    PEAK DISCHARGE RATE =      15.37 CFS  AT   1.500 HOURS   BASIN AREA =   .0074 SQ. MI.


*S BASIN 109: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=17  HYD NO=109.0  AREA=0.00672 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   11.143    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .002822 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   10.370    CFS   UNIT VOLUME =    .9992       B =   354.67      P60 = 1.8700
    AREA =      .003898 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=17  CODE=1

                                PARTIAL HYDROGRAPH   109.00

    RUNOFF VOLUME =    1.29860 INCHES     =        .4654 ACRE-FEET
    PEAK DISCHARGE RATE =      13.99 CFS  AT   1.500 HOURS   BASIN AREA =   .0067 SQ. MI.


*S COMBINE BASINS 108 AND 109 TOGETHER
ADD HYD             ID=18  HYD NO=109.1  ID=16  ID=17
PRINT HYD           ID=18  CODE=1

                                PARTIAL HYDROGRAPH   109.10

    RUNOFF VOLUME =    1.29855 INCHES     =        .9767 ACRE-FEET
    PEAK DISCHARGE RATE =      29.36 CFS  AT   1.500 HOURS   BASIN AREA =   .0141 SQ. MI.


*S BASIN 110: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=19  HYD NO=110.0  AREA=0.008436 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
```

```
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   13.988    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.8700
    AREA =      .003543 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   13.018    CFS   UNIT VOLUME =    .9994       B =   354.67      P60 = 1.8700
    AREA =      .004893 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=19  CODE=1

                                PARTIAL HYDROGRAPH   110.00


    RUNOFF VOLUME =     1.29860 INCHES     =        .5843 ACRE-FEET
    PEAK DISCHARGE RATE =      17.56 CFS  AT   1.500 HOURS   BASIN AREA =   .0084 SQ. MI.


*S BASIN 111: PARK
COMPUTE NM HYD      ID=20  HYD NO=111.0  AREA=0.003149 SQ MI
                    PER A=33  PER B=19  PER C=19  PER D=29
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   3.6054    CFS   UNIT VOLUME =    .9961       B =   526.28      P60 = 1.8700
    AREA =      .000913 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   5.2171    CFS   UNIT VOLUME =    .9973       B =   311.05      P60 = 1.8700
    AREA =      .002236 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=20  CODE=1

                                PARTIAL HYDROGRAPH   111.00


    RUNOFF VOLUME =     1.00753 INCHES     =        .1692 ACRE-FEET
    PEAK DISCHARGE RATE =       5.20 CFS  AT   1.500 HOURS   BASIN AREA =   .0031 SQ. MI.


*S BASIN 112: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=1  HYD NO=112.0  AREA=0.002915 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   4.8336    CFS   UNIT VOLUME =    .9969       B =   526.28      P60 = 1.8700
    AREA =      .001224 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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```
    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   4.4984    CFS   UNIT VOLUME =    .9975       B =   354.67      P60 = 1.8700
    AREA =       .001691 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=1  CODE=1

                                PARTIAL HYDROGRAPH   112.00

    RUNOFF VOLUME =     1.29860 INCHES     =        .2019 ACRE-FEET
    PEAK DISCHARGE RATE =       6.08 CFS  AT   1.500 HOURS   BASIN AREA =   .0029 SQ. MI.


*S COMBINE BASINS 111 AND 112 TOGETHER
ADD HYD             ID=2  HYD NO=112.1  ID=20  ID=1
PRINT HYD           ID=2  CODE=1

                                PARTIAL HYDROGRAPH   112.10

    RUNOFF VOLUME =     1.14736 INCHES     =        .3711 ACRE-FEET
    PEAK DISCHARGE RATE =      11.27 CFS  AT   1.500 HOURS   BASIN AREA =   .0061 SQ. MI.


*S BASIN 113: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=3  HYD NO=113.0  AREA=0.006265 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.389    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 = 1.8700
    AREA =       .002631 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   9.6681    CFS   UNIT VOLUME =    .9991       B =   354.67      P60 = 1.8700
    AREA =       .003634 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=3  CODE=1

                                PARTIAL HYDROGRAPH   113.00

    RUNOFF VOLUME =     1.29860 INCHES     =        .4339 ACRE-FEET
    PEAK DISCHARGE RATE =      13.04 CFS  AT   1.500 HOURS   BASIN AREA =   .0063 SQ. MI.


*S COMBINE BASINS 113 AND 118 TOGETHER
ADD HYD             ID=4  HYD NO=113.1  ID=3  ID=18
PRINT HYD           ID=4  CODE=1

                                PARTIAL HYDROGRAPH   113.10
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    RUNOFF VOLUME =      1.29855 INCHES      =        1.4106 ACRE-FEET
    PEAK DISCHARGE RATE =       42.40 CFS  AT   1.500 HOURS   BASIN AREA =   .0204 SQ. MI.


*S COMBINE BASINS 113 AND 118 TOGETHER
ADD HYD              ID=5  HYD NO=113.2  ID=3  ID=18
PRINT HYD            ID=5  CODE=1

                                PARTIAL HYDROGRAPH   113.20

    RUNOFF VOLUME =      1.29855 INCHES      =        1.4106 ACRE-FEET
    PEAK DISCHARGE RATE =       42.40 CFS  AT   1.500 HOURS   BASIN AREA =   .0204 SQ. MI.


*S BASIN 114: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=6  HYD NO=114.0  AREA=0.00737 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   12.221    CFS   UNIT VOLUME =     .9984       B =   526.28      P60 = 1.8700
    AREA =       .003095 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   11.373    CFS   UNIT VOLUME =     .9993       B =   354.67      P60 = 1.8700
    AREA =       .004275 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=6  CODE=1

                                PARTIAL HYDROGRAPH   114.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .5104 ACRE-FEET
    PEAK DISCHARGE RATE =       15.34 CFS  AT   1.500 HOURS   BASIN AREA =   .0074 SQ. MI.


*S COMBINE BASINS 110 AND 114 TOGETHER
ADD HYD              ID=7  HYD NO=114.1  ID=19  ID=6
PRINT HYD            ID=7  CODE=1

                                PARTIAL HYDROGRAPH   114.10

    RUNOFF VOLUME =      1.29856 INCHES      =        1.0947 ACRE-FEET
    PEAK DISCHARGE RATE =       32.90 CFS  AT   1.500 HOURS   BASIN AREA =   .0158 SQ. MI.


*S COMBINE HYDROGRAPH NO 113.2 AND 114.1 TOGETHER
ADD HYD              ID=8  HYD NO=114.2  ID=5  ID=7
PRINT HYD            ID=8  CODE=1
```

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                                PARTIAL HYDROGRAPH   114.20

    RUNOFF VOLUME =      1.29856 INCHES      =        2.5053 ACRE-FEET
    PEAK DISCHARGE RATE =       75.29 CFS  AT   1.500 HOURS   BASIN AREA =   .0362 SQ. MI.


*S COMBINE HYDROGRAPH NO 107.2 AND 114.2 TOGETHER
ADD HYD              ID=9  HYD NO=114.3  ID=15  ID=8
PRINT HYD            ID=9  CODE=1

                                PARTIAL HYDROGRAPH   114.30

    RUNOFF VOLUME =      1.29855 INCHES      =        5.7657 ACRE-FEET
    PEAK DISCHARGE RATE =      173.31 CFS  AT   1.500 HOURS   BASIN AREA =   .0833 SQ. MI.


*S BASIN 120.1: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)
COMPUTE NM HYD       ID=10  HYD NO=120.1  AREA=0.00073 SQ MI
                     PER A=0  PER B=20 PER C=20 PER D=60
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   1.7292    CFS   UNIT VOLUME =    .9933       B =   526.28      P60 = 1.8700
    AREA =      .000438 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   .77692    CFS   UNIT VOLUME =    .9831       B =   354.67      P60 = 1.8700
    AREA =      .000292 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=10  CODE=1

                                PARTIAL HYDROGRAPH   120.10

    RUNOFF VOLUME =      1.50556 INCHES      =         .0586 ACRE-FEET
    PEAK DISCHARGE RATE =        1.70 CFS  AT   1.500 HOURS   BASIN AREA =   .0007 SQ. MI.


*S BASIN 120.2: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)
COMPUTE NM HYD       ID=11  HYD NO=120.2  AREA=0.002814 SQ MI
                     PER A=0  PER B=20  PER C=20  PER D=60
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.6659    CFS   UNIT VOLUME =    .9976       B =   526.28      P60 = 1.8700
    AREA =      .001688 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   2.9949    CFS   UNIT VOLUME =    .9958       B =   354.67      P60 = 1.8700
```

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    AREA =       .001126 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=11  CODE=1

                                  PARTIAL HYDROGRAPH   120.20


    RUNOFF VOLUME =     1.50556 INCHES     =        .2260 ACRE-FEET
    PEAK DISCHARGE RATE =       6.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0028 SQ. MI.


*S BASIN 120.3: OFFSITE: UNSER BLVD. MEDIAN AREA
COMPUTE NM HYD       ID=12  HYD NO=120.3  AREA=0.002147 SQ MI
                     PER A=0  PER B=20  PER C=20  PER D=60
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.0859    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =       .001288 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   2.2850    CFS   UNIT VOLUME =    .9948       B =   354.67      P60 = 1.8700
    AREA =       .000859 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=12  CODE=1

                                  PARTIAL HYDROGRAPH   120.30

    RUNOFF VOLUME =     1.50556 INCHES     =        .1724 ACRE-FEET
    PEAK DISCHARGE RATE =       4.96 CFS  AT   1.500 HOURS   BASIN AREA =   .0021 SQ. MI.


FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 13:21:35
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =06/30/1997
INPUT FILE = DESRT10.DAT USER NO.= ISCARFNM.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S	DESERT FLOWER SUBDIVISION - 10 YR POST DEVELOPMENT									
*S	DESRT10.DAT									
*S	REVISED BY: JMN 6/27/97									
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 1.470
*S BASIN 100: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	100.00	-	1	.00608	7.23	.229	.70640	1.500	1.858	PER IMP= 42.00
*S BASIN 101: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	101.00	-	2	.00432	5.14	.163	.70639	1.500	1.859	PER IMP= 42.00
*S COMBINE BASINS 100 AND 101 TOGETHER										
ADD HYD	101.10	1& 2	3	.01040	12.37	.392	.70634	1.500	1.858	
*S BASIN 102: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	102.00	-	4	.00728	8.66	.274	.70639	1.500	1.857	PER IMP= 42.00
*S COMBINE BASIN 102 TO HYDROGRAPH NO 101.1										
ADD HYD	102.10	3& 4	5	.01769	21.03	.666	.70634	1.500	1.858	
*S BASIN 103: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	103.00	-	6	.00953	11.33	.359	.70639	1.500	1.857	PER IMP= 42.00
*S COMBINE BASINS 103 AND HYDROGRAPH NO. 102.1 TOGETHER										
ADD HYD	103.10	5& 6	7	.02722	32.35	1.025	.70635	1.500	1.858	
*S BASIN 104: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	140.00	-	8	.00470	5.59	.177	.70639	1.500	1.859	PER IMP= 42.00
*S COMBINE BASIN 104 AND HYDROGRAPH 103.1 TOGETHER										
ADD HYD	104.10	7& 8	9	.03191	37.94	1.202	.70635	1.500	1.858	
*S BASIN 105: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	105.00	-	10	.00503	5.98	.190	.70639	1.500	1.858	PER IMP= 42.00
*S BASIN 106: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	106.10	-	11	.00390	4.64	.147	.70639	1.500	1.859	PER IMP= 42.00
*S COMBINE BASINS 106 AND 105 TOGETHER										
ADD HYD	106.10	10&11	12	.00893	10.62	.336	.70633	1.500	1.859	
*S BASIN 107: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	107.00	-	13	.00623	7.41	.235	.70639	1.500	1.858	PER IMP= 42.00
*S COMBINE BASIN 107 AND HYDROGRAPH NO 104.1 TOGETHER										
ADD HYD	107.10	13& 9	14	.03815	45.36	1.437	.70635	1.500	1.858	
*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER										
ADD HYD	107.20	12&14	15	.04708	55.98	1.774	.70634	1.500	1.858	
*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER										
ADD HYD	107.20	12&14	15	.04708	55.98	1.774	.70634	1.500	1.858	
*S BASIN 108: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	108.00	-	16	.00738	8.78	.278	.70639	1.500	1.857	PER IMP= 42.00
*S BASIN 109: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	109.00	-	17	.00672	7.99	.253	.70639	1.500	1.858	PER IMP= 42.00
*S COMBINE BASINS 108 AND 109 TOGETHER										
ADD HYD	109.10	16&17	18	.01410	16.77	.531	.70635	1.500	1.858	
*S BASIN 110: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	110.00	-	19	.00844	10.03	.318	.70639	1.500	1.857	PER IMP= 42.00
*S BASIN 111: PARK										
COMPUTE NM HYD	111.00	-	20	.00315	2.60	.084	.49728	1.500	1.290	PER IMP= 29.00
*S BASIN 112: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	112.00	-	1	.00292	3.47	.110	.70639	1.500	1.860	PER IMP= 42.00
*S COMBINE BASINS 111 AND 112 TOGETHER										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	112.10	20& 1	2	.00606	6.07	.193	.59771	1.500	1.564	
*S BASIN 113: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	113.00	-	3	.00627	7.45	.236	.70639	1.500	1.858	PER IMP= 42.00
*S COMBINE BASINS 113 AND 118 TOGETHER										
ADD HYD	113.10	3&18	4	.02037	24.21	.767	.70635	1.500	1.858	
*S COMBINE BASINS 113 AND 118 TOGETHER										
ADD HYD	113.20	3&18	5	.02037	24.21	.767	.70635	1.500	1.858	
*S BASIN 114: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	114.00	-	6	.00737	8.76	.278	.70639	1.500	1.857	PER IMP= 42.00
*S COMBINE BASINS 110 AND 114 TOGETHER										
ADD HYD	114.10	19& 6	7	.01581	18.79	.595	.70636	1.500	1.857	
*S COMBINE HYDROGRAPH NO 113.2 AND 114.1 TOGETHER										
ADD HYD	114.20	5& 7	8	.03617	43.00	1.363	.70635	1.500	1.857	
*S COMBINE HYDROGRAPH NO 107.2 AND 114.2 TOGETHER										
ADD HYD	114.30	15& 8	9	.08325	98.98	3.136	.70635	1.500	1.858	
*S BASIN 120.1: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)										
COMPUTE NM HYD	120.10	-	10	.00073	1.03	.034	.87139	1.500	2.203	PER IMP= 60.00
*S BASIN 120.2: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)										
COMPUTE NM HYD	120.20	-	11	.00281	3.94	.131	.87139	1.500	2.189	PER IMP= 60.00
*S BASIN 120.3: OFFSITE: UNSER BLVD. MEDIAN AREA										
COMPUTE NM HYD	120.30	-	12	.00215	3.01	.100	.87139	1.500	2.191	PER IMP= 60.00
FINISH										

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    AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
          RUN DATE (MON/DAY/YR) = 06/30/1997
          START TIME (HR:MIN:SEC) = 13:24:08     USER NO.= ISCARFNM.I01
          INPUT FILE = DESRT10.DAT

*S                  DESERT FLOWER SUBDIVISION - 10 YR POST DEVELOPMENT
*S                  DESRT10.DAT
*S                  REVISED BY: JMN 6/27/97
*
START               RAINFALL BEGINS AT 0.0 HRS
RAINFALL            TYPE=1 RAIN QUARTER=0 RAIN ONE=1.26
                    RAIN SIX=1.47 RAIN DAY=2.66 DT=0.03333HR

                COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                DT =     .033330 HOURS       END TIME =     5.999400 HOURS
                   .0000    .0010    .0020    .0030    .0040    .0051    .0062
                   .0073    .0085    .0096    .0109    .0121    .0134    .0147
                   .0160    .0174    .0188    .0203    .0218    .0234    .0250
                   .0267    .0285    .0303    .0322    .0342    .0363    .0385
                   .0408    .0432    .0458    .0492    .0530    .0569    .0655
                   .0846    .1140    .1563    .2140    .2898    .3864    .5068
                   .6537    .7901    .8470    .8951    .9378    .9767   1.0126
                  1.0458   1.0769   1.1060   1.1334   1.1593   1.1837   1.2068
                  1.2287   1.2495   1.2692   1.2879   1.3057   1.3098   1.3135
                  1.3171   1.3205   1.3238   1.3269   1.3299   1.3328   1.3355
                  1.3382   1.3408   1.3433   1.3457   1.3481   1.3504   1.3526
                  1.3548   1.3569   1.3590   1.3610   1.3629   1.3649   1.3667
                  1.3686   1.3704   1.3722   1.3739   1.3756   1.3773   1.3789
                  1.3805   1.3821   1.3837   1.3852   1.3867   1.3882   1.3897
                  1.3911   1.3925   1.3939   1.3953   1.3967   1.3980   1.3993
                  1.4006   1.4019   1.4032   1.4045   1.4057   1.4069   1.4081
                  1.4093   1.4105   1.4117   1.4128   1.4140   1.4151   1.4162
                  1.4174   1.4184   1.4195   1.4206   1.4217   1.4227   1.4238
                  1.4248   1.4258   1.4268   1.4278   1.4288   1.4298   1.4308
                  1.4318   1.4327   1.4337   1.4346   1.4356   1.4365   1.4374
                  1.4383   1.4392   1.4401   1.4410   1.4419   1.4428   1.4437
                  1.4445   1.4454   1.4462   1.4471   1.4479   1.4487   1.4496
                  1.4504   1.4512   1.4520   1.4528   1.4536   1.4544   1.4552
                  1.4560   1.4568   1.4575   1.4583   1.4591   1.4598   1.4606
                  1.4613   1.4621   1.4628   1.4636   1.4643   1.4650   1.4657
                  1.4665   1.4672   1.4679   1.4686   1.4693   1.4700

*S BASIN 100: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=1 HYD NO=100.00 AREA=0.00608 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.082    CFS   UNIT VOLUME =     .9982       B =   526.28      P60 = 1.2600
    AREA =       .002554 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .124821HR    TP =    .133300HR    K/TP RATIO =    .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =    8.9947    CFS   UNIT VOLUME =    .9987       B =   340.01      P60 = 1.2600
    AREA =       .003526 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330
```

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PRINT HYD            ID=1   CODE=1

                                   PARTIAL HYDROGRAPH   100.00

    RUNOFF VOLUME =       .70640 INCHES     =         .2291 ACRE-FEET
    PEAK DISCHARGE RATE =       7.23 CFS  AT   1.500 HOURS   BASIN AREA =   .0061 SQ. MI.


*S BASIN 101: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=2 HYD NO=101.00 AREA=0.004321 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.1650    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.2600
    AREA =      .001815 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   6.3925    CFS   UNIT VOLUME =    .9981       B =   340.01      P60 = 1.2600
    AREA =      .002506 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=2   CODE=1

                                   PARTIAL HYDROGRAPH   101.00

    RUNOFF VOLUME =       .70639 INCHES     =         .1628 ACRE-FEET
    PEAK DISCHARGE RATE =       5.14 CFS  AT   1.500 HOURS   BASIN AREA =   .0043 SQ. MI.


*S COMBINE BASINS 100 AND 101 TOGETHER
ADD HYD              ID=3  HYD NO=101.1  ID=1  ID=2
PRINT HYD            ID=3  CODE=1

                                   PARTIAL HYDROGRAPH   101.10

    RUNOFF VOLUME =       .70634 INCHES     =         .3918 ACRE-FEET
    PEAK DISCHARGE RATE =      12.37 CFS  AT   1.500 HOURS   BASIN AREA =   .0104 SQ. MI.


*S BASIN 102: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=4 HYD NO=102.00 AREA=0.007284 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   12.078    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.2600
    AREA =      .003059 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
    K =    .124821HR    TP =    .133300HR    K/TP RATIO =    .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =    10.776    CFS   UNIT VOLUME =    .9990       B =   340.01      P60 = 1.2600
    AREA =       .004225 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=4   CODE=1

                                PARTIAL HYDROGRAPH   102.00

    RUNOFF VOLUME =       .70639 INCHES     =        .2744 ACRE-FEET
    PEAK DISCHARGE RATE =       8.66 CFS  AT   1.500 HOURS   BASIN AREA =   .0073 SQ. MI.


*S COMBINE BASIN 102 TO HYDROGRAPH NO 101.1
ADD HYD             ID=5  HYD NO=102.1  ID=3  ID=4
PRINT HYD           ID=5  CODE=1

                                PARTIAL HYDROGRAPH   102.10

    RUNOFF VOLUME =       .70634 INCHES     =        .6662 ACRE-FEET
    PEAK DISCHARGE RATE =      21.03 CFS  AT   1.500 HOURS   BASIN AREA =   .0177 SQ. MI.


*S BASIN 103: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=6 HYD NO=103.00 AREA=0.00953 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    15.802    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 = 1.2600
    AREA =       .004003 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

    K =    .124821HR    TP =    .133300HR    K/TP RATIO =    .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =    14.099    CFS   UNIT VOLUME =    .9993       B =   340.01      P60 = 1.2600
    AREA =       .005527 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=6   CODE=1

                                PARTIAL HYDROGRAPH   103.00

    RUNOFF VOLUME =       .70639 INCHES     =        .3590 ACRE-FEET
    PEAK DISCHARGE RATE =      11.33 CFS  AT   1.500 HOURS   BASIN AREA =   .0095 SQ. MI.


*S COMBINE BASINS 103 AND HYDROGRAPH NO. 102.1 TOGETHER
ADD HYD             ID=7  HYD NO=103.1 ID=5  ID=6
PRINT HYD           ID=7  CODE=1

                                PARTIAL HYDROGRAPH   103.10
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```
    RUNOFF VOLUME =       .70635 INCHES      =        1.0252 ACRE-FEET
    PEAK DISCHARGE RATE =       32.35 CFS  AT   1.500 HOURS   BASIN AREA =   .0272 SQ. MI.


*S BASIN 104: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=8 HYD NO=140.00 AREA=0.004699 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.7918    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.2600
    AREA =      .001974 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   6.9517    CFS   UNIT VOLUME =    .9982       B =   340.01      P60 = 1.2600
    AREA =      .002725 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=8   CODE=1

                                   PARTIAL HYDROGRAPH   140.00


    RUNOFF VOLUME =       .70639 INCHES      =         .1770 ACRE-FEET
    PEAK DISCHARGE RATE =        5.59 CFS  AT   1.500 HOURS   BASIN AREA =   .0047 SQ. MI.


*S COMBINE BASIN 104 AND HYDROGRAPH 103.1 TOGETHER
ADD HYD              ID=9  HYD NO=104.1  ID=7  ID=8
PRINT HYD            ID=9  CODE=1

                                   PARTIAL HYDROGRAPH   104.10


    RUNOFF VOLUME =       .70635 INCHES      =        1.2023 ACRE-FEET
    PEAK DISCHARGE RATE =       37.94 CFS  AT   1.500 HOURS   BASIN AREA =   .0319 SQ. MI.


*S BASIN 105: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=10  HYD NO=105.00 AREA=0.00503 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   8.3407    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.2600
    AREA =      .002113 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   7.4414    CFS   UNIT VOLUME =    .9984       B =   340.01      P60 = 1.2600
    AREA =      .002917 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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```
PRINT HYD            ID=10  CODE=1

                                   PARTIAL HYDROGRAPH   105.00

    RUNOFF VOLUME =       .70639 INCHES      =         .1895 ACRE-FEET
    PEAK DISCHARGE RATE =        5.98 CFS  AT   1.500 HOURS   BASIN AREA =   .0050 SQ. MI.


*S BASIN 106: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=11  HYD NO=106.10 AREA=0.0039 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.4669    CFS   UNIT VOLUME =    .9976       B =   526.28      P60 = 1.2600
    AREA =       .001638 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   5.7697    CFS   UNIT VOLUME =    .9979       B =   340.01      P60 = 1.2600
    AREA =       .002262 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=11   CODE=1

                                   PARTIAL HYDROGRAPH   106.10

    RUNOFF VOLUME =       .70639 INCHES      =         .1469 ACRE-FEET
    PEAK DISCHARGE RATE =        4.64 CFS  AT   1.500 HOURS   BASIN AREA =   .0039 SQ. MI.


*S COMBINE BASINS 106 AND 105 TOGETHER
ADD HYD              ID=12  HYD NO=106.1  ID=10  ID=11
PRINT HYD            ID=12  CODE=1

                                   PARTIAL HYDROGRAPH   106.10

    RUNOFF VOLUME =       .70633 INCHES      =         .3364 ACRE-FEET
    PEAK DISCHARGE RATE =       10.62 CFS  AT   1.500 HOURS   BASIN AREA =   .0089 SQ. MI.


*S BASIN 107: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=13  HYD NO=107.0  AREA=0.006234 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.337    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 = 1.2600
    AREA =       .002618 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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```
    K =    .124821HR    TP =    .133300HR    K/TP RATIO =    .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =    9.2226    CFS   UNIT VOLUME =     .9989       B =   340.01      P60 = 1.2600
    AREA =       .003616 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=13  CODE=1

                                   PARTIAL HYDROGRAPH   107.00

    RUNOFF VOLUME =       .70639 INCHES     =         .2349 ACRE-FEET
    PEAK DISCHARGE RATE =       7.41 CFS  AT   1.500 HOURS   BASIN AREA =   .0062 SQ. MI.


*S COMBINE BASIN 107 AND HYDROGRAPH NO 104.1 TOGETHER
ADD HYD             ID=14  HYD NO=107.1  ID=13  ID=9
PRINT HYD           ID=14  CODE=1

                                   PARTIAL HYDROGRAPH   107.10

    RUNOFF VOLUME =       .70635 INCHES     =        1.4371 ACRE-FEET
    PEAK DISCHARGE RATE =      45.36 CFS  AT   1.500 HOURS   BASIN AREA =   .0381 SQ. MI.


*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER
ADD HYD             ID=15  HYD NO=107.2  ID=12  ID=14
PRINT HYD           ID=15  CODE=1

                                   PARTIAL HYDROGRAPH   107.20

    RUNOFF VOLUME =       .70634 INCHES     =        1.7735 ACRE-FEET
    PEAK DISCHARGE RATE =      55.98 CFS  AT   1.500 HOURS   BASIN AREA =   .0471 SQ. MI.


*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER
ADD HYD             ID=15  HYD NO=107.2  ID=12  ID=14
PRINT HYD           ID=15  CODE=1

                                   PARTIAL HYDROGRAPH   107.20

    RUNOFF VOLUME =       .70634 INCHES     =        1.7735 ACRE-FEET
    PEAK DISCHARGE RATE =      55.98 CFS  AT   1.500 HOURS   BASIN AREA =   .0471 SQ. MI.


*S BASIN 108: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=16  HYD NO=108.0  AREA=0.007383 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    12.242    CFS   UNIT VOLUME =     .9984       B =   526.28      P60 = 1.2600
    AREA =       .003101 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
```

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    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   10.922    CFS   UNIT VOLUME =    .9990       B =   340.01      P60 = 1.2600
    AREA =      .004282 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=16  CODE=1

                                PARTIAL HYDROGRAPH   108.00

    RUNOFF VOLUME =      .70639 INCHES     =        .2781 ACRE-FEET
    PEAK DISCHARGE RATE =       8.78 CFS  AT   1.500 HOURS   BASIN AREA =   .0074 SQ. MI.


*S BASIN 109: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=17  HYD NO=109.0  AREA=0.00672 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   11.143    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.2600
    AREA =      .002822 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   9.9416    CFS   UNIT VOLUME =    .9989       B =   340.01      P60 = 1.2600
    AREA =      .003898 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=17  CODE=1

                                PARTIAL HYDROGRAPH   109.00

    RUNOFF VOLUME =      .70639 INCHES     =        .2532 ACRE-FEET
    PEAK DISCHARGE RATE =       7.99 CFS  AT   1.500 HOURS   BASIN AREA =   .0067 SQ. MI.


*S COMBINE BASINS 108 AND 109 TOGETHER
ADD HYD             ID=18  HYD NO=109.1  ID=16  ID=17
PRINT HYD           ID=18  CODE=1

                                PARTIAL HYDROGRAPH   109.10

    RUNOFF VOLUME =      .70635 INCHES     =        .5313 ACRE-FEET
    PEAK DISCHARGE RATE =      16.77 CFS  AT   1.500 HOURS   BASIN AREA =   .0141 SQ. MI.


*S BASIN 110: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=19  HYD NO=110.0  AREA=0.008436 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
```

```
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   13.988    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.2600
    AREA =      .003543 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   12.480    CFS   UNIT VOLUME =    .9992       B =   340.01      P60 = 1.2600
    AREA =      .004893 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=19  CODE=1

                                PARTIAL HYDROGRAPH   110.00

    RUNOFF VOLUME =      .70639 INCHES     =        .3178 ACRE-FEET
    PEAK DISCHARGE RATE =      10.03 CFS  AT   1.500 HOURS   BASIN AREA =   .0084 SQ. MI.


*S BASIN 111: PARK
COMPUTE NM HYD      ID=20  HYD NO=111.0  AREA=0.003149 SQ MI
                    PER A=33  PER B=19  PER C=19  PER D=29
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   3.6054    CFS   UNIT VOLUME =    .9961       B =   526.28      P60 = 1.2600
    AREA =      .000913 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .150031HR    TP =   .133300HR    K/TP RATIO =  1.125516     SHAPE CONSTANT, N =  3.143803
    UNIT PEAK =   4.9201    CFS   UNIT VOLUME =    .9970       B =   293.34      P60 = 1.2600
    AREA =      .002236 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=20  CODE=1

                                PARTIAL HYDROGRAPH   111.00

    RUNOFF VOLUME =      .49728 INCHES     =        .0835 ACRE-FEET
    PEAK DISCHARGE RATE =       2.60 CFS  AT   1.500 HOURS   BASIN AREA =   .0031 SQ. MI.


*S BASIN 112: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=1  HYD NO=112.0  AREA=0.002915 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   4.8336    CFS   UNIT VOLUME =    .9969       B =   526.28      P60 = 1.2600
    AREA =      .001224 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   4.3124    CFS   UNIT VOLUME =    .9971       B =   340.01      P60 = 1.2600
    AREA =      .001691 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1  CODE=1

                                PARTIAL HYDROGRAPH   112.00

    RUNOFF VOLUME =      .70639 INCHES     =        .1098 ACRE-FEET
    PEAK DISCHARGE RATE =       3.47 CFS  AT   1.500 HOURS   BASIN AREA =   .0029 SQ. MI.


*S COMBINE BASINS 111 AND 112 TOGETHER
ADD HYD             ID=2  HYD NO=112.1  ID=20  ID=1
PRINT HYD           ID=2  CODE=1

                                PARTIAL HYDROGRAPH   112.10

    RUNOFF VOLUME =      .59771 INCHES     =        .1933 ACRE-FEET
    PEAK DISCHARGE RATE =       6.07 CFS  AT   1.500 HOURS   BASIN AREA =   .0061 SQ. MI.


*S BASIN 113: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=3  HYD NO=113.0  AREA=0.006265 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.389    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 = 1.2600
    AREA =      .002631 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   9.2684    CFS   UNIT VOLUME =    .9989       B =   340.01      P60 = 1.2600
    AREA =      .003634 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=3  CODE=1

                                PARTIAL HYDROGRAPH   113.00

    RUNOFF VOLUME =      .70639 INCHES     =        .2360 ACRE-FEET
    PEAK DISCHARGE RATE =       7.45 CFS  AT   1.500 HOURS   BASIN AREA =   .0063 SQ. MI.


*S COMBINE BASINS 113 AND 118 TOGETHER
ADD HYD             ID=4  HYD NO=113.1  ID=3  ID=18
PRINT HYD           ID=4  CODE=1

                                PARTIAL HYDROGRAPH   113.10
```

```
RUNOFF VOLUME =       .70635 INCHES      =         .7673 ACRE-FEET
PEAK DISCHARGE RATE =      24.21 CFS  AT   1.500 HOURS   BASIN AREA =   .0204 SQ. MI.


*S COMBINE BASINS 113 AND 118 TOGETHER
ADD HYD              ID=5  HYD NO=113.2  ID=3  ID=18
PRINT HYD            ID=5  CODE=1

                                PARTIAL HYDROGRAPH   113.20

RUNOFF VOLUME =       .70635 INCHES      =         .7673 ACRE-FEET
PEAK DISCHARGE RATE =      24.21 CFS  AT   1.500 HOURS   BASIN AREA =   .0204 SQ. MI.


*S BASIN 114: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=6  HYD NO=114.0  AREA=0.00737 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   12.221    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.2600
AREA =      .003095 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
UNIT PEAK =   10.903    CFS   UNIT VOLUME =    .9990       B =   340.01      P60 = 1.2600
AREA =      .004275 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=6  CODE=1

                                PARTIAL HYDROGRAPH   114.00

RUNOFF VOLUME =       .70639 INCHES      =         .2777 ACRE-FEET
PEAK DISCHARGE RATE =       8.76 CFS  AT   1.500 HOURS   BASIN AREA =   .0074 SQ. MI.


*S COMBINE BASINS 110 AND 114 TOGETHER
ADD HYD              ID=7  HYD NO=114.1  ID=19  ID=6
PRINT HYD            ID=7  CODE=1

                                PARTIAL HYDROGRAPH   114.10

RUNOFF VOLUME =       .70636 INCHES      =         .5954 ACRE-FEET
PEAK DISCHARGE RATE =      18.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0158 SQ. MI.


*S COMBINE HYDROGRAPH NO 113.2 AND 114.1 TOGETHER
ADD HYD              ID=8  HYD NO=114.2  ID=5  ID=7
PRINT HYD            ID=8  CODE=1
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```
                                PARTIAL HYDROGRAPH   114.20

    RUNOFF VOLUME =       .70635 INCHES     =       1.3627 ACRE-FEET
    PEAK DISCHARGE RATE =      43.00 CFS  AT   1.500 HOURS   BASIN AREA =   .0362 SQ. MI.


*S COMBINE HYDROGRAPH NO 107.2 AND 114.2 TOGETHER
ADD HYD              ID=9  HYD NO=114.3  ID=15  ID=8
PRINT HYD            ID=9  CODE=1

                                PARTIAL HYDROGRAPH   114.30

    RUNOFF VOLUME =       .70635 INCHES     =       3.1362 ACRE-FEET
    PEAK DISCHARGE RATE =      98.98 CFS  AT   1.500 HOURS   BASIN AREA =   .0833 SQ. MI.


*S BASIN 120.1: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)
COMPUTE NM HYD       ID=10  HYD NO=120.1  AREA=0.00073 SQ MI
                     PER A=0  PER B=20 PER C=20 PER D=60
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   1.7292    CFS   UNIT VOLUME =    .9933       B =   526.28      P60 = 1.2600
    AREA =      .000438 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   .74480    CFS   UNIT VOLUME =    .9816       B =   340.01      P60 = 1.2600
    AREA =      .000292 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=10  CODE=1

                                PARTIAL HYDROGRAPH   120.10

    RUNOFF VOLUME =       .87139 INCHES     =        .0339 ACRE-FEET
    PEAK DISCHARGE RATE =       1.03 CFS  AT   1.500 HOURS   BASIN AREA =   .0007 SQ. MI.


*S BASIN 120.2: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)
COMPUTE NM HYD       ID=11  HYD NO=120.2  AREA=0.002814 SQ MI
                     PER A=0  PER B=20  PER C=20  PER D=60
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.6659    CFS   UNIT VOLUME =    .9976       B =   526.28      P60 = 1.2600
    AREA =      .001688 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   2.8711    CFS   UNIT VOLUME =    .9954       B =   340.01      P60 = 1.2600
```

```
    AREA =       .001126 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=11  CODE=1

                                  PARTIAL HYDROGRAPH   120.20

    RUNOFF VOLUME =       .87139 INCHES     =        .1308 ACRE-FEET
    PEAK DISCHARGE RATE =       3.94 CFS  AT   1.500 HOURS   BASIN AREA =   .0028 SQ. MI.


*S BASIN 120.3: OFFSITE: UNSER BLVD. MEDIAN AREA
COMPUTE NM HYD       ID=12  HYD NO=120.3  AREA=0.002147 SQ MI
                     PER A=0  PER B=20  PER C=20  PER D=60
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.0859    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.2600
    AREA =       .001288 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   2.1905    CFS   UNIT VOLUME =    .9939       B =   340.01      P60 = 1.2600
    AREA =       .000859 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=12  CODE=1
                                  PARTIAL HYDROGRAPH   120.30

    RUNOFF VOLUME =       .87139 INCHES     =        .0998 ACRE-FEET
    PEAK DISCHARGE RATE =       3.01 CFS  AT   1.500 HOURS   BASIN AREA =   .0021 SQ. MI.


FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 13:24:11
```

APPENDIX B

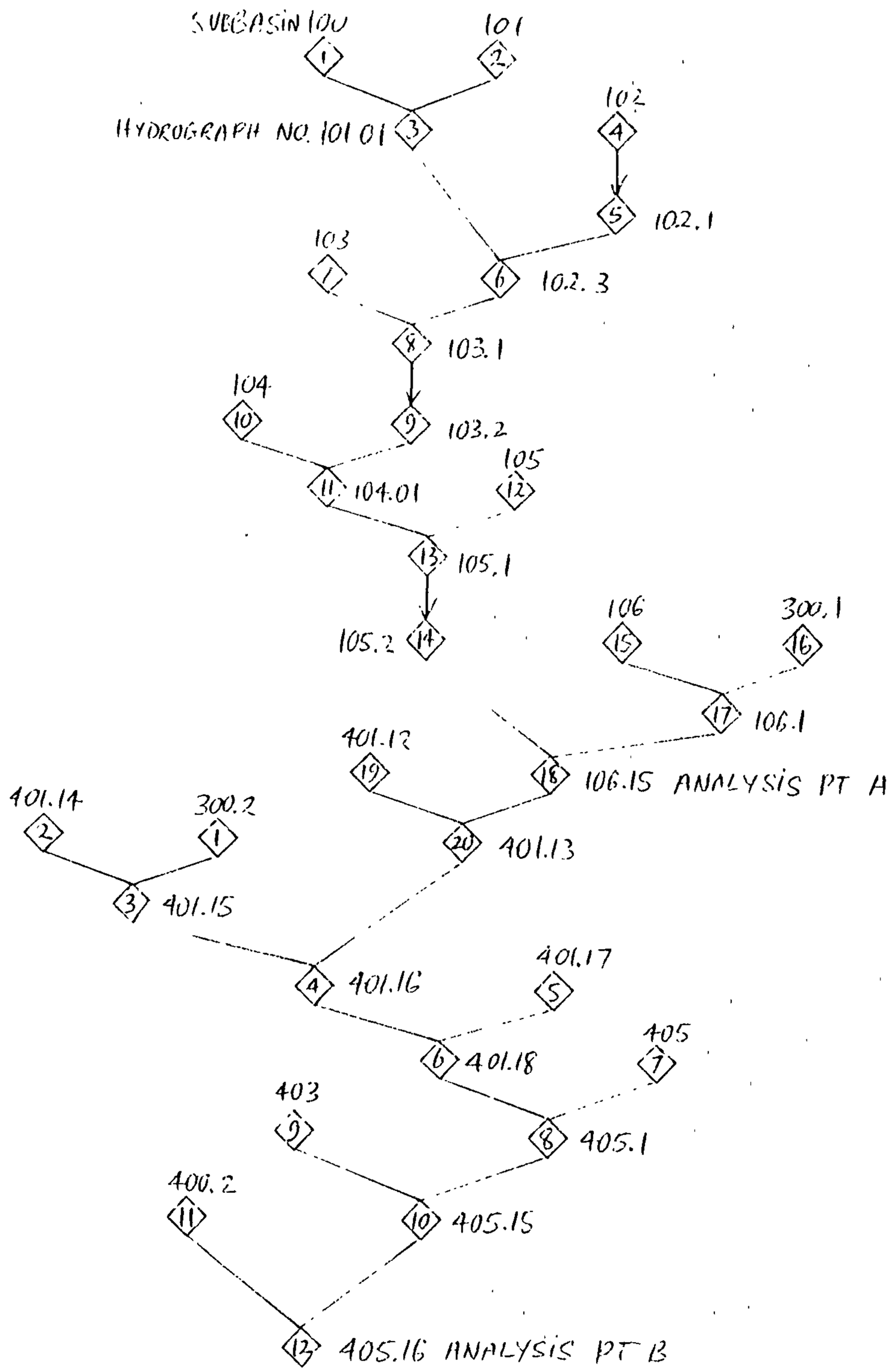
OFFSITE AHYMO SUMMARY & DETAILED OUTPUT

```
AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994          RUN DATE (MON/DAY/YR) =06/28/1997
INPUT FILE = DESRTOFF.DAT                                                                 USER NO.= ISCARFNM.I01

                                FROM  TO                      PEAK        RUNOFF                 TIME TO    CFS      PAGE =   1
                   HYDROGRAPH    ID   ID          AREA     DISCHARGE     VOLUME      RUNOFF        PEAK     PER
COMMAND          IDENTIFICATION  NO.  NO.        (SQ MI)     (CFS)       (AC-FT)    (INCHES)     (HOURS)   ACRE      NOTATION

*S                  DESERT FLOWER SUBDIVISION - 100 YR POST DEVELOPMENT
*S                  REVISED BY: JMN 6/27/97
*S
START                                                                                                          TIME=        .00
RAINFALL  TYPE= 1                                                                                              RAIN6=     2.200
*S BASIN 100 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL
*S BE @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD          100.00   -     1        .07150       148.70       4.952      1.29860     1.500     3.250 PER IMP=  42.00
*S BASIN 101 IS FULLY DEVELOPED WITH SINGLE FAMILY RESIDENTIAL HOMES
*S WITH A DENSTIY OF 4 DU/AC
COMPUTE NM HYD          101.00   -     2        .03700        60.90       1.988      1.00753     1.500     2.572 PER IMP=  29.00
ADD HYD                 101.01  1& 2   3        .10850       209.60       6.940      1.19933     1.500     3.018
*S **AREA 102 IS A MIDDLE SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD          102.00   -     4        .04000        33.21        .937       .43925     1.533     1.297 PER IMP=    .00
*S ROUTE THE SCHOOL'S RUNOFF IN A 28' F-F RESIDENTIAL STREET, S=2%
*S ASSUME SECTION EXTENDS TO THE ROW LINE ON BOTH SIDES
ROUTE                   102.10    4    5        .04000        32.41        .937       .43927     1.567     1.266
*S ADD THE ROUTED FLOW FROM 102 TO THE EARLIER TOTAL
ADD HYD                 102.30  3& 5   6        .14850       236.14       7.877       .99460     1.500     2.485
*S **BASIN 103 IS COMPLETELY DEVELOPED
COMPUTE NM HYD          103.00   -     7        .04400        72.42       2.364      1.00753     1.500     2.572 PER IMP=  29.00
*S ADD 103 TO TOTAL
ADD HYD                 103.10  6& 7   8        .19250       308.56      10.242       .99755     1.500     2.505
*S **ASSUME FLOW IS ROUTED IN 28' STREET AS EARLIER
ROUTE                   103.20    8    9        .19250       293.93      10.242       .99756     1.533     2.386
*S **AREA 104 IS FULLY DEVELOPED
COMPUTE NM HYD          104.00   -    10        .04400        72.42       2.364      1.00753     1.500     2.572 PER IMP=  29.00
*S ADD THE FLOW TO THE TOTAL
ADD HYD                 104.01  9&10  11        .23650       364.94      12.606       .99941     1.533     2.411
*S AREA 105 IS A PARK & COA WELL SITE
COMPUTE NM HYD          105.00   -    12        .02100        29.05        .849       .75825     1.500     2.161 PER IMP=   7.00
ADD HYD                 105.10 11&12  13        .25750       393.90      13.455       .97974     1.533     2.390
*S ROUTE THE FLOW TO THE EXISTING END OF SAPPHIRE ST.
ROUTE                   105.20   13   14        .25750       364.47      13.455       .97974     1.567     2.212
*S AREA 106 IS FULLY DEVELOPED
COMPUTE NM HYD          106.00   -    15        .02177        35.84       1.170      1.00753     1.500     2.572 PER IMP=  29.00
*S BASIN 300.1 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S A DENSITY OF 4 DU/AC
COMPUTE NM HYD          300.10   -    16        .01560        32.45       1.080      1.29860     1.500     3.250 PER IMP=  42.00
*S **ADD THE FLOWS FROM BASINS 106 AND 300.1
ADD HYD                 106.10 15&16  17        .03737        68.29       2.250      1.12902     1.500     2.855
*S **TOTAL FLOW IN SAPHIRE ST AT ANALYSIS POINT A
ADD HYD                 106.15 14&17  18        .29487       423.63      15.705       .99866     1.567     2.245
*S  **BASIN 401.12, 401.14, 401.17, 300.2 AND 400.2 DRAINS TO SAPPHIRE ST.
*S  **BASIN 401.12 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD          401.12   -    19        .01126        23.43        .780      1.29860     1.500     3.251 PER IMP=  42.00
*S  **ADD THE FLOWS FROM HYDROGRAPH NO 401.12 AND 106.15
ADD HYD                 401.13 19&18  20        .30613       443.65      16.485      1.00969     1.567     2.264
*S  **BASIN 300.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
*S  @ A DENSITY OF 4 DU/AC
```

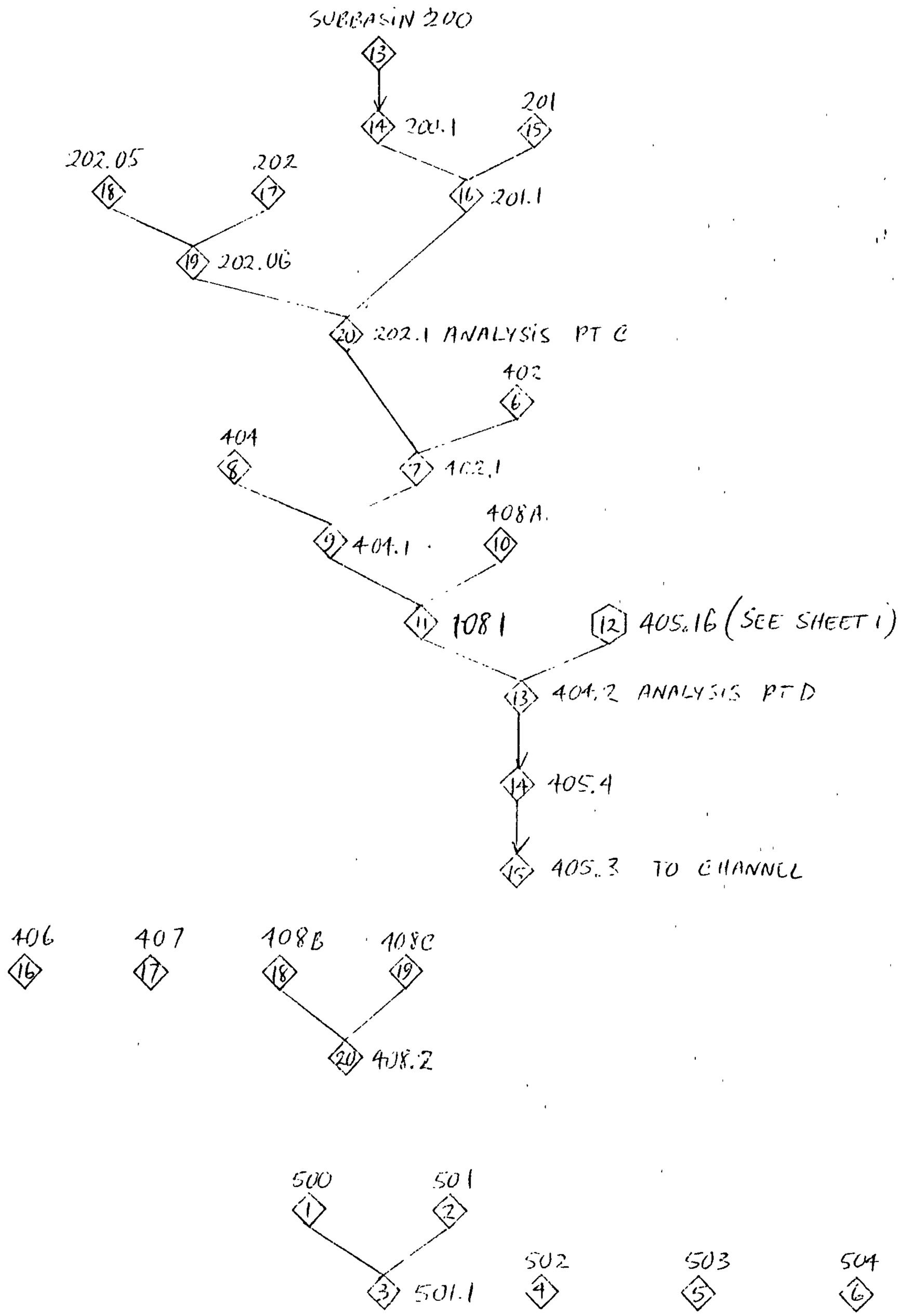
SUBBASINS FLOWCHART



ISAACSON & ARFMAN, P.A.

SUBJECT DESERT FLOWER JOB NO.

BY JMN DATE 6/97 SHEET NO. 1 OF 2



ISAACSON & ARFMAN, P.A.

SUBJECT _____ JOB NO. ____

BY _____ DATE _____ SHEET NO. 2 OF 2

```
                          FROM  TO                    PEAK        RUNOFF                  TIME TO   CFS
                HYDROGRAPH  ID   ID        AREA    DISCHARGE     VOLUME     RUNOFF         PEAK    PER
COMMAND       IDENTIFICATION  NO.  NO.    (SQ MI)     (CFS)      (AC-FT)   (INCHES)      (HOURS)  ACRE      NOTATION

COMPUTE NM HYD        300.20   -    1     .01180      24.55        .817    1.29859        1.500   3.251 PER IMP=  42.00
*S ** BASIN 401.14 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD        401.14   -    2     .01117      23.24        .774    1.29860        1.500   3.251 PER IMP=  42.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.14 AND 300.2
ADD HYD               401.15  1& 2  3     .02297      47.79       1.591    1.29857        1.500   3.251
*S **ADD FLOWS FROM HYDROGRAPH NO 401.15 AND 401.13
ADD HYD               401.16  3&20  4     .32910     484.48      18.076    1.02985        1.567   2.300
*S **BASIN 401.17 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD        401.17   -    5     .00661      13.76        .458    1.29860        1.500   3.252 PER IMP=  42.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.16 AND 401.17
ADD HYD               401.18  4& 5  6     .33571     496.23      18.534    1.03514        1.567   2.310
*S ** BASIN 405 DRAINS TO SAPPHIRE ST.
COMPUTE NM HYD        405.00   -    7     .01393      29.33        .982    1.32159        1.500   3.289 PER IMP=  44.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.18 AND 405
ADD HYD               405.10  6& 7  8     .34964     521.25      19.516    1.04656        1.567   2.329
*S ** BASIN 403 DRAINS TO SAPPHIRE ST.
COMPUTE NM HYD        403.00   -    9     .01480      30.79       1.025    1.29860        1.500   3.250 PER IMP=  42.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 405.1 AND 403
ADD HYD               405.15  8& 9  10    .36444     547.55      20.541    1.05679        1.567   2.348
*S ** BASIN 400.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
*S @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD        400.20   -   11     .03222      67.80       2.271    1.32159        1.500   3.288 PER IMP=  44.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 405.15 AND 400.2 TOGETHER TO GET THE FLOW
*S IN SAPPHIRE ST. @ ANALYSIS PT B
ADD HYD               405.16 10&11  12    .39666     607.35      22.812    1.07830        1.533   2.392
*S*************************************************************************
*S*************************************************************************
*S **BASINS 200,201, & 202 DRAIN TO KIMELA DR
COMPUTE NM HYD        200.00   -   13     .05300      87.23       2.848    1.00753        1.500   2.572 PER IMP=  29.00
*S **ROUTE FLOW TO THE END OF KIMELA DR.
ROUTE                 200.10  13   14     .05300      86.94       2.848    1.00753        1.533   2.563
COMPUTE NM HYD        201.00   -   15     .02600      42.80       1.397    1.00753        1.500   2.572 PER IMP=  29.00
ADD HYD               201.10 15&14  16    .07900     128.91       4.245    1.00752        1.533   2.550
*S **BASIN 202 IS AN ELEMENTARY SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD        202.00   -   17     .00925       7.69        .217     .43925        1.533   1.298 PER IMP=    .00
*S **BASIN 202.05 IS THE ELEMENTARY SCHOOL PARKING LOT THAT WILL DRAIN TO KIMELA
COMPUTE NM HYD        202.05   -   18     .00375      10.49        .393    1.96548        1.500   4.373 PER IMP= 100.00
*S **ADD THE BASINS OF THE ELEMENTARY SCHOOL AND PARKING LOT
ADD HYD               202.06 17&18  19    .01300      18.01        .610     .87913        1.500   2.164
*S **ADD THE BASINS TOGETHER TO GET THE FLOW IN KIMELA DR @ ANALYSIS PT C
ADD HYD               202.10 16&19  20    .09200     146.56       4.855     .98938        1.533   2.489
*S*************************************************************************
*S*************************************************************************
*S **BASINS 402 THRU 404 ARE CURRENTLY UNDEVELOPED, FOR PURPOSES
*S OF THIS REPORT, ASSUME ALL BASINS WILL BE BUILT OUT @ THEIR CURRENT
*S ZONING
*S **BASIN 402 IS UNIT 2 OF SUNRISE ESTATES
COMPUTE NM HYD        402.00   -    6     .05200     108.14       3.601    1.29860        1.500   3.249 PER IMP=  42.00
*S **ADD BASIN 402 TO THE TOTAL FLOW @ THE END OF EXTENDED KIMELA
ADD HYD               402.10 20& 6   7    .14400     251.21       8.456    1.10104        1.533   2.726
*S **COMPUTE HYDROGRAPH FOR BASIN 404
COMPUTE NM HYD        404.00   -    8     .01080      22.47        .748    1.29860        1.500   3.251 PER IMP=  42.00
*S **ADD FLOW TO THAT IN KIMELA DR
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                          FROM  TO                        PEAK        RUNOFF                        TIME TO   CFS
                HYDROGRAPH  ID   ID        AREA      DISCHARGE     VOLUME       RUNOFF              PEAK     PER
COMMAND       IDENTIFICATION  NO.  NO.    (SQ MI)      (CFS)      (AC-FT)     (INCHES)            (HOURS)   ACRE      NOTATION

ADD HYD              404.10  7& 8   9      .15480      272.95       9.204      1.11482             1.533    2.755
*S **COMPUTE HYDROGRAPH FOR BASIN 408A
COMPUTE NM HYD        408A    -    10      .01175       24.45        .814      1.29860             1.500    3.251 PER IMP=  42.00
*S **COMBINE FLOWS FROM HYDROGRAPH NO. 404.1 AND 408A
ADD HYD              408.10  9&10  11      .16655      296.74      10.018      1.12778             1.500    2.784
*S **ADD TO FLOW IN SAPPHIRE ST @ ANALYSIS PT D
ADD HYD              404.20 11&12  13      .56321      903.96      32.829      1.09293             1.533    2.508
*S DESIGN A RETENTION FACILITY TO REDUCE TO FLOW TO THAT WHICH WILL
*S FIT IN A 48" RCP @ S=1.8%
ROUTE RESERVOIR      405.40   13   14      .56321      192.06      32.829      1.09293             2.000     .533 AC-FT=   18.722
*S ROUTE FLOW FROM THE DETENTION POND TO THE AMOLE DEL NORTE CHANNEL
ROUTE                405.30   14   15      .56321      192.05      32.829      1.09293             2.000     .533
*S*************************************************************************
*S*************************************************************************
*S **CALC BASIN 406
COMPUTE NM HYD       406.00    -   16      .05743      117.49       3.920      1.27968             1.500    3.196 PER IMP=  42.00
*S **CALC BASIN 407
COMPUTE NM HYD       407.00    -   17      .05040      104.81       3.491      1.29860             1.500    3.249 PER IMP=  42.00
*S **CALC BASIN 408B
COMPUTE NM HYD        408B     -   18      .09501      197.65       6.580      1.29860             1.500    3.250 PER IMP=  42.00
*S **CALC BASIN 408C
COMPUTE NM HYD        408C     -   19      .05060      105.23       3.504      1.29860             1.500    3.249 PER IMP=  42.00
*S **COMBINE FLOWS FROM BASIN 408B AND 408C
ADD HYD              408.20 18&19  20      .14561      302.87      10.085      1.29859             1.500    3.250
*S*************************************************************************
*S*************************************************************************
*S **BASIN 500 IS UNIT ONE OF THE PROPOSED LONGFORD SD
COMPUTE NM HYD       500.00    -    1      .02491       51.80       1.725      1.29860             1.500    3.250 PER IMP=  42.00
*S **BASIN 501 IS THE AREA PROPOSED AS FUTURE LONGFORD SD DRAINING
*S **DIRECTLY TO THE AMOLE CHANNEL
COMPUTE NM HYD       501.00    -    2      .03663       76.18       2.537      1.29860             1.500    3.249 PER IMP=  42.00
*S **COMBINE BASINS 500 AND 501 TOGETHER TO REPRESENT THE NORTHERN PART OF THE
*S **LONGFORD SD
ADD HYD              501.10  1& 2   3      .06154      127.98       4.262      1.29859             1.500    3.250
*S **BASIN 502 IS THE SOUTHERN PART OF THE LONGFORD SD
COMPUTE NM HYD       502.00    -    4      .05788      121.79       4.080      1.32159             1.500    3.288 PER IMP=  44.00
*S **BASIN 503 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S **A DENSITY OF 4 DU/AC. THE DISCHARGE FROM THIS BASIN DRAINS TO THE AMOLE
*S DEL NORTE CHANNEL AND DOES NOT AFFECT THE ARENAL/UNSER DRAINAGE MANAGEMENT
*S SITE.
COMPUTE NM HYD       503.00    -    5      .03752       78.03       2.599      1.29860             1.500    3.249 PER IMP=  42.00
*S*************************************************************************
*S **BASIN 504 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S **A DENSITY OF 4 DU/AC. THE DISCHARGE FROM THIS BASIN TRAVEL ALONG SAGE RD.
*S AND ENTERS THE AMOLE DEL NORTE CHANNEL, DOES NOT AFFECT THE ARENAL/UNSER
*S DRAINAGE MANAGEMENT SITE.
COMPUTE NM HYD       504.00    -    6      .03667       77.16       2.585      1.32159             1.500    3.288 PER IMP=  44.00
*S **BASIN 505 IS FULLY DEVELOPED AND DRAINS SOUTH TO BLAKE RD..DISCHARGE FROM
*S THIS BASIN DOES NOT AFFECT THE ARENAL/UNSER DRAINAGE MANAGEMENT SITE.
COMPUTE NM HYD       505.00    -    7      .02618       43.10       1.407      1.00753             1.500    2.572 PER IMP=  29.00
FINISH
```

```
AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 06/28/1997
     START TIME (HR:MIN:SEC) = 14:22:36      USER NO.= ISCARFNM.I01
     INPUT FILE = DESRTOFF.DAT

*S                DESERT FLOWER SUBDIVISION - 100 YR POST DEVELOPMENT
*S                REVISED BY: JMN 6/27/97
*S
START             RAINFALL BEGINS AT 0.0 HRS
RAINFALL          TYPE=1 RAIN QUARTER=0 RAIN ONE=1.87
                  RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333HR

            COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
            DT =     .033330 HOURS        END TIME =     5.999400 HOURS
               .0000   .0016   .0033   .0050   .0067   .0085   .0103
               .0122   .0141   .0160   .0180   .0201   .0222   .0243
               .0266   .0289   .0312   .0337   .0362   .0388   .0415
               .0443   .0472   .0502   .0534   .0567   .0601   .0637
               .0675   .0715   .0758   .0809   .0865   .0924   .1050
               .1334   .1771   .2398   .3254   .4379   .5814   .7600
               .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
              1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
              1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
              1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
              1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
              2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
              2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
              2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
              2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
              2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
              2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  2.1159
              2.1176  2.1193  2.1210  2.1227  2.1244  2.1260  2.1276
              2.1292  2.1308  2.1324  2.1340  2.1355  2.1371  2.1386
              2.1401  2.1416  2.1431  2.1446  2.1460  2.1475  2.1489
              2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
              2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
              2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
              2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
              2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
              2.1944  2.1956  2.1967  2.1978  2.1989  2.2000

*S BASIN 100 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL
*S BE @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD       ID=1 HYD NO=100.00 AREA=0.07150 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

   K =    .072801HR    TP =    .133300HR    K/TP RATIO =    .546145     SHAPE CONSTANT, N =  7.087329
   UNIT PEAK =   118.36    CFS   UNIT VOLUME =    .9992       B =   525.38      P60 = 1.8700
   AREA =       .030030 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

   K =    .118190HR    TP =    .133300HR    K/TP RATIO =    .886648     SHAPE CONSTANT, N =  4.001119
   UNIT PEAK =   110.52    CFS   UNIT VOLUME =    1.000       B =   355.24      P60 = 1.8700
   AREA =       .041470 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330
```

```
PRINT HYD            ID=1   CODE=1

                                PARTIAL HYDROGRAPH   100.00

    RUNOFF VOLUME =      1.29860 INCHES      =       4.9519 ACRE-FEET
    PEAK DISCHARGE RATE =      148.70 CFS  AT   1.500 HOURS   BASIN AREA =   .0715 SQ. MI.


*S BASIN 101 IS FULLY DEVELOPED WITH SINGLE FAMILY RESIDENTIAL HOMES
*S WITH A DENSTIY OF 4 DU/AC
COMPUTE NM HYD       ID=2 HYD NO=101.00 AREA=0.03700 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   42.363    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 = 1.8700
    AREA =      .010730 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   61.299    CFS   UNIT VOLUME =    .9998       B =   311.05      P60 = 1.8700
    AREA =      .026270 SQ MI    IA =    .52958 INCHES    INF =  1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=2   CODE=1

                                PARTIAL HYDROGRAPH   101.00

    RUNOFF VOLUME =      1.00753 INCHES      =       1.9882 ACRE-FEET
    PEAK DISCHARGE RATE =       60.90 CFS  AT   1.500 HOURS   BASIN AREA =   .0370 SQ. MI.


ADD HYD              ID=3 HYD NO=101.01 ID=1 ID=2
PRINT HYD            ID=3 CODE=1

                                PARTIAL HYDROGRAPH   101.01

    RUNOFF VOLUME =      1.19933 INCHES      =       6.9401 ACRE-FEET
    PEAK DISCHARGE RATE =      209.60 CFS  AT   1.500 HOURS   BASIN AREA =   .1085 SQ. MI.


*S **AREA 102 IS A MIDDLE SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD       ID=4 HYD NO=102.00 AREA=0.04000 SQ MI
                     PER A=100 PER B=0 PER C=0 PER D=0
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .163684HR    TP =   .133300HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   82.084    CFS   UNIT VOLUME =    .9995       B =   273.54      P60 = 1.8700
    AREA =      .040000 SQ MI    IA =    .65000 INCHES    INF =  1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=4   CODE=1
```

PARTIAL HYDROGRAPH 102.00

RUNOFF VOLUME = .43925 INCHES = .9371 ACRE-FEET
PEAK DISCHARGE RATE = 33.21 CFS AT 1.533 HOURS BASIN AREA = .0400 SQ. MI.

```
*S ROUTE THE SCHOOL'S RUNOFF IN A 28' F-F RESIDENTIAL STREET, S=2%
*S ASSUME SECTION EXTENDS TO THE ROW LINE ON BOTH SIDES
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME  ID=5 REACH NO=1 NO VS=1 L=650 FT SLP=0.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.1670
.105	.554	.95	.1052
.158	1.246	2.80	.0803
.211	2.215	6.03	.0663
.263	3.461	10.94	.0571
.316	4.920	18.84	.0472
.368	6.394	29.08	.0397
.421	7.869	41.00	.0347
.474	9.344	54.46	.0310
.526	10.821	69.37	.0282
.579	12.298	85.66	.0259

```
                                .632       13.776       103.24        .0241
                                .684       15.261       119.89        .0230
                                .737       16.869       132.52        .0230
                                .790       18.644       147.34        .0228
                                .842       20.586       164.39        .0226
                                .895       22.695       183.72        .0223
                                .947       24.971       205.41        .0219
                               1.000       27.414       229.56        .0216
ROUTE                 ID=5 HYD NO=102.1 INFLOW ID=4 DT=0.0
PRINT HYD             ID=5 CODE=1

                                PARTIAL HYDROGRAPH   102.10

    RUNOFF VOLUME =       .43927 INCHES     =        .9371 ACRE-FEET
    PEAK DISCHARGE RATE =      32.41 CFS  AT   1.567 HOURS   BASIN AREA =   .0400 SQ. MI.


*S ADD THE ROUTED FLOW FROM 102 TO THE EARLIER TOTAL
ADD HYD               ID=6 HYD NO=102.3 ID=3 ID=5
PRINT HYD             ID=6 CODE=1

                                PARTIAL HYDROGRAPH   102.30

    RUNOFF VOLUME =       .99460 INCHES     =       7.8772 ACRE-FEET
    PEAK DISCHARGE RATE =     236.14 CFS  AT   1.500 HOURS   BASIN AREA =   .1485 SQ. MI.


*S **BASIN 103 IS COMPLETELY DEVELOPED
COMPUTE NM HYD        ID=7 HYD NO=103.00 AREA=0.04400 SQ MI
                      PER A=33 PER B=19 PER C=19 PER D=29
                      TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   50.377    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .012760 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   72.896    CFS   UNIT VOLUME =    .9999       B =   311.05      P60 = 1.8700
    AREA =      .031240 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD             ID=7   CODE=1

                                PARTIAL HYDROGRAPH   103.00

    RUNOFF VOLUME =      1.00753 INCHES     =       2.3643 ACRE-FEET
    PEAK DISCHARGE RATE =      72.42 CFS  AT   1.500 HOURS   BASIN AREA =   .0440 SQ. MI.


*S ADD 103 TO TOTAL
ADD HYD               ID=8 HYD NO=103.1 ID=6 ID=7
```

PRINT HYD ID=8 CODE=1

PARTIAL HYDROGRAPH 103.10

RUNOFF VOLUME = .99755 INCHES = 10.2415 ACRE-FEET
PEAK DISCHARGE RATE = 308.56 CFS AT 1.500 HOURS BASIN AREA = .1925 SQ. MI.

*S **ASSUME FLOW IS ROUTED IN 28' STREET AS EARLIER
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	101.00	10.0	100.67	10.1	100.00	24.0	100.28
38.0	100.00	38.1	100.67	48.0	101.00		

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

COMPUTE TRAVEL TIME ID=9 REACH NO=1 NO VS=1 L=900 FT SLP=0.02

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.2312
.105	.554	.95	.1457
.158	1.246	2.80	.1112
.211	2.215	6.03	.0918
.263	3.461	10.94	.0791
.316	4.920	18.84	.0653
.368	6.394	29.08	.0550
.421	7.869	41.00	.0480
.474	9.344	54.46	.0429
.526	10.821	69.37	.0390

```
                                .579      12.298       85.66       .0359
                                .632      13.776      103.24       .0334
                                .684      15.261      119.89       .0318
                                .737      16.869      132.52       .0318
                                .790      18.644      147.34       .0316
                                .842      20.586      164.39       .0313
                                .895      22.695      183.72       .0309
                                .947      24.971      205.41       .0304
                               1.000      27.414      229.56       .0299
   ROUTE                 ID=9 HYD NO=103.2 INFLOW ID=8 DT=0.0
TRAVEL TIME TABLE EXCEEDED
   PRINT HYD             ID=9 CODE=1

                                PARTIAL HYDROGRAPH   103.20

      RUNOFF VOLUME =       .99756 INCHES      =      10.2415 ACRE-FEET
      PEAK DISCHARGE RATE =     293.93 CFS  AT   1.533 HOURS   BASIN AREA =   .1925 SQ. MI.


   *S **AREA 104 IS FULLY DEVELOPED
   COMPUTE NM HYD       ID=10 HYD NO=104.00 AREA=0.04400 SQ MI
                        PER A=33 PER B=19 PER C=19 PER D=29
                        TP=-0.1333 HR   MASS RAIN=-1

      K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
      UNIT PEAK =   50.377    CFS   UNIT VOLUME =     .9992        B =   526.28      P60 = 1.8700
      AREA =       .012760 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

      K =    .139463HR    TP =    .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
      UNIT PEAK =   72.896    CFS   UNIT VOLUME =     .9999        B =   311.05      P60 = 1.8700
      AREA =       .031240 SQ MI    IA =     .52958 INCHES    INF =   1.33282 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

   PRINT HYD            ID=10   CODE=1

                                PARTIAL HYDROGRAPH   104.00

      RUNOFF VOLUME =      1.00753 INCHES      =       2.3643 ACRE-FEET
      PEAK DISCHARGE RATE =      72.42 CFS  AT   1.500 HOURS   BASIN AREA =   .0440 SQ. MI.


   *S ADD THE FLOW TO THE TOTAL
   ADD HYD              ID=11 HYD NO=104.01 ID=9 ID=10
   PRINT HYD            ID=11 CODE=1

                                PARTIAL HYDROGRAPH   104.01

      RUNOFF VOLUME =       .99941 INCHES      =      12.6058 ACRE-FEET
      PEAK DISCHARGE RATE =     364.94 CFS  AT   1.533 HOURS   BASIN AREA =   .2365 SQ. MI.
```

```
*S AREA 105 IS A PARK & COA WELL SITE
COMPUTE NM HYD       ID=12 HYD NO=105.00 AREA=0.021 SQ MI
                     PER A=31 PER B=31 PER C=31 PER D=7
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.8036    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =      .001470 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .133514HR    TP =   .133300HR    K/TP RATIO =  1.001607     SHAPE CONSTANT, N =  3.524575
    UNIT PEAK =   47.194    CFS   UNIT VOLUME =    1.000       B =   322.12      P60 = 1.8700
    AREA =      .019530 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=12   CODE=1

                                  PARTIAL HYDROGRAPH   105.00


    RUNOFF VOLUME =      .75825 INCHES     =        .8492 ACRE-FEET
    PEAK DISCHARGE RATE =      29.05 CFS  AT   1.500 HOURS   BASIN AREA =   .0210 SQ. MI.


ADD HYD              ID=13 HYD NO=105.1 ID=11 ID=12
PRINT HYD            ID=13 CODE=1

                                  PARTIAL HYDROGRAPH   105.10


    RUNOFF VOLUME =      .97974 INCHES     =      13.4550 ACRE-FEET
    PEAK DISCHARGE RATE =     393.90 CFS  AT   1.533 HOURS   BASIN AREA =   .2575 SQ. MI.


*S ROUTE THE FLOW TO THE EXISTING END OF SAPPHIRE ST.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06

100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME. ID=14 REACH NO=1 NO VS=1 L=1200 FT SLP=0.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.3083
.105	.554	.95	.1942
.158	1.246	2.80	.1482
.211	2.215	6.03	.1223
.263	3.461	10.94	.1054
.316	4.920	18.84	.0871
.368	6.394	29.08	.0733
.421	7.869	41.00	.0640
.474	9.344	54.46	.0572
.526	10.821	69.37	.0520
.579	12.298	85.66	.0479
.632	13.776	103.24	.0445
.684	15.261	119.89	.0424
.737	16.869	132.52	.0424
.790	18.644	147.34	.0422
.842	20.586	164.39	.0417
.895	22.695	183.72	.0412
.947	24.971	205.41	.0405
1.000	27.414	229.56	.0398

```
   ROUTE                  ID=14 HYD NO=105.2 INFLOW ID=13 DT=0.0
TRAVEL TIME TABLE EXCEEDED
   PRINT HYD              ID=14 CODE=1
```

PARTIAL HYDROGRAPH 105.20

```
    RUNOFF VOLUME =       .97974 INCHES      =      13.4550 ACRE-FEET
    PEAK DISCHARGE RATE =     364.47 CFS  AT   1.567 HOURS   BASIN AREA =   .2575 SQ. MI.


   *S AREA 106 IS FULLY DEVELOPED
   COMPUTE NM HYD       ID=15 HYD NO=106.00 AREA=0.02177 SQ MI
                        PER A=33 PER B=19 PER C=19 PER D=29
                        TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000    SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   24.925    CFS   UNIT VOLUME =     .9989        B =   526.28       P60 = 1.8700
    AREA =       .006313 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330
```

```
    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   36.067    CFS   UNIT VOLUME =    .9997       B =   311.05      P60 = 1.8700
    AREA =      .015457 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=15   CODE=1

                                PARTIAL HYDROGRAPH   106.00

    RUNOFF VOLUME =     1.00753 INCHES     =       1.1698 ACRE-FEET
    PEAK DISCHARGE RATE =      35.84 CFS  AT   1.500 HOURS   BASIN AREA =   .0218 SQ. MI.


*S BASIN 300.1 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S A DENSITY OF 4 DU/AC
COMPUTE NM HYD      ID=16 HYD NO=300.1  AREA=0.0156 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   25.868    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .006552 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   24.074    CFS   UNIT VOLUME =    .9999       B =   354.67      P60 = 1.8700
    AREA =      .009048 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
PRINT HYD           ID=16   CODE=1

                                HYDROGRAPH FROM AREA   300.10

    RUNOFF VOLUME =     1.29860 INCHES     =       1.0804 ACRE-FEET
    PEAK DISCHARGE RATE =      32.45 CFS  AT   1.500 HOURS   BASIN AREA =   .0156 SQ. MI.


*S **ADD THE FLOWS FROM BASINS 106 AND 300.1
ADD HYD             ID=17  HYD NO=106.1  ID=15  ID=16
PRINT HYD           ID=17  CODE=1

                                PARTIAL HYDROGRAPH   106.10

    RUNOFF VOLUME =     1.12902 INCHES     =       2.2502 ACRE-FEET
    PEAK DISCHARGE RATE =      68.29 CFS  AT   1.500 HOURS   BASIN AREA =   .0374 SQ. MI.


*S **TOTAL FLOW IN SAPHIRE ST AT ANALYSIS POINT A
ADD HYD             ID=18 HYD NO=106.15 ID=14 ID=17
PRINT HYD           ID=18 CODE=1

                                PARTIAL HYDROGRAPH   106.15
```

```
    RUNOFF VOLUME =       .99866 INCHES     =      15.7052 ACRE-FEET
    PEAK DISCHARGE RATE =     423.63 CFS  AT   1.567 HOURS   BASIN AREA =   .2949 SQ. MI.


*S  **BASIN 401.12, 401.14, 401.17, 300.2 AND 400.2 DRAINS TO SAPPHIRE ST.
*S  **BASIN 401.12 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD       ID=19 HYD NO=401.12 AREA=0.01126 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   18.671    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004729 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   17.376    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =      .006531 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=19  CODE=1

                                    HYDROGRAPH FROM AREA   401.12


    RUNOFF VOLUME =     1.29860 INCHES     =        .7798 ACRE-FEET
    PEAK DISCHARGE RATE =      23.43 CFS  AT   1.500 HOURS   BASIN AREA =   .0113 SQ. MI.


*S  **ADD THE FLOWS FROM HYDROGRAPH NO 401.12 AND 106.15
ADD HYD              ID=20 HYD NO=401.13 ID=19 ID=18
PRINT HYD            ID=20  CODE=1

                                    HYDROGRAPH FROM AREA   401.13


    RUNOFF VOLUME =     1.00969 INCHES     =      16.4850 ACRE-FEET
    PEAK DISCHARGE RATE =     443.65 CFS  AT   1.567 HOURS   BASIN AREA =   .3061 SQ. MI.


*S  **BASIN 300.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
*S  @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD       ID=1 HYD NO=300.2 AREA=0.0118 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   19.567    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004956 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   18.210    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
```

```
    AREA =       .006844 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=1  CODE=1

                                    HYDROGRAPH FROM AREA   300.20

    RUNOFF VOLUME =     1.29859 INCHES     =        .8172 ACRE-FEET
    PEAK DISCHARGE RATE =      24.55 CFS  AT   1.500 HOURS   BASIN AREA =    .0118 SQ. MI.


*S ** BASIN 401.14 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD       ID=2 HYD NO=401.14 AREA=0.01117 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   18.522    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =       .004691 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   17.237    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =       .006479 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=2 CODE=1

                                    HYDROGRAPH FROM AREA   401.14

    RUNOFF VOLUME =     1.29860 INCHES     =        .7736 ACRE-FEET
    PEAK DISCHARGE RATE =      23.24 CFS  AT   1.500 HOURS   BASIN AREA =    .0112 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 401.14 AND 300.2
ADD HYD              ID=3 HYD NO=401.15 ID=1 ID=2
PRINT HYD            ID=3 CODE=1

                                    HYDROGRAPH FROM AREA   401.15

    RUNOFF VOLUME =     1.29857 INCHES     =       1.5908 ACRE-FEET
    PEAK DISCHARGE RATE =      47.79 CFS  AT   1.500 HOURS   BASIN AREA =    .0230 SQ. MI.


*S **ADD FLOWS FROM HYDROGRAPH NO 401.15 AND 401.13
ADD HYD              ID=4 HYD NO=401.16 ID=3 ID=20
PRINT HYD            ID=4 CODE=1

                                    HYDROGRAPH FROM AREA   401.16

    RUNOFF VOLUME =     1.02985 INCHES     =      18.0759 ACRE-FEET
```

```
    PEAK DISCHARGE RATE =     484.48 CFS  AT   1.567 HOURS   BASIN AREA =   .3291 SQ. MI.


*S **BASIN 401.17 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD       ID=5 HYD NO=401.17 AREA=0.00661 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.961    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .002776 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   10.201    CFS   UNIT VOLUME =    .9992       B =   354.67      P60 = 1.8700
    AREA =      .003834 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=5 CODE=1

                                   HYDROGRAPH FROM AREA   401.17


    RUNOFF VOLUME =     1.29860 INCHES     =        .4578 ACRE-FEET
    PEAK DISCHARGE RATE =      13.76 CFS  AT   1.500 HOURS   BASIN AREA =   .0066 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 401.16 AND 401.17
ADD HYD              ID=6 HYD NO=401.18 ID=4 ID=5
PRINT HYD            ID=6 CODE=1

                                   HYDROGRAPH FROM AREA   401.18


    RUNOFF VOLUME =     1.03514 INCHES     =      18.5337 ACRE-FEET
    PEAK DISCHARGE RATE =     496.23 CFS  AT   1.567 HOURS   BASIN AREA =   .3357 SQ. MI.


*S ** BASIN 405 DRAINS TO SAPPHIRE ST.
COMPUTE NM HYD       ID=7  HYD NO=405.0  AREA=0.013934 SQ MI
                     PER A=0 PER B=28 PER C=28 PER D=44
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   24.205    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .006131 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   20.761    CFS   UNIT VOLUME =    .9998       B =   354.67      P60 = 1.8700
    AREA =      .007803 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=7 CODE=1
```

```
                                    HYDROGRAPH FROM AREA   405.00

    RUNOFF VOLUME =     1.32159 INCHES     =        .9821 ACRE-FEET
    PEAK DISCHARGE RATE =      29.33 CFS  AT   1.500 HOURS   BASIN AREA =   .0139 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 401.18 AND 405
ADD HYD              ID=8 HYD NO=405.1  ID=6 ID=7
PRINT HYD            ID=8 CODE=1

                                    HYDROGRAPH FROM AREA   405.10

    RUNOFF VOLUME =     1.04656 INCHES     =      19.5158 ACRE-FEET
    PEAK DISCHARGE RATE =     521.25 CFS  AT   1.567 HOURS   BASIN AREA =   .3496 SQ. MI.


*S ** BASIN 403 DRAINS TO SAPPHIRE ST.
COMPUTE NM HYD       ID=9  HYD NO=403.0  AREA=0.0148 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   24.541    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .006216 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   22.839    CFS   UNIT VOLUME =    .9999       B =   354.67      P60 = 1.8700
    AREA =      .008584 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=9 CODE=1

                                    HYDROGRAPH FROM AREA   403.00

    RUNOFF VOLUME =     1.29860 INCHES     =       1.0250 ACRE-FEET
    PEAK DISCHARGE RATE =      30.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0148 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 405.1 AND 403
ADD HYD              ID=10 HYD NO=405.15  ID=8 ID=9
PRINT HYD            ID=10 CODE=1

                                    HYDROGRAPH FROM AREA   405.15

    RUNOFF VOLUME =     1.05679 INCHES     =      20.5408 ACRE-FEET
    PEAK DISCHARGE RATE =     547.55 CFS  AT   1.567 HOURS   BASIN AREA =   .3644 SQ. MI.


*S ** BASIN 400.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
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```
*S @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD        ID=11  HYD NO=400.2  AREA=0.032215 SQ MI
                      PER A=0 PER B=28 PER C=28 PER D=44
                      TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   55.962    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .014175 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   48.000    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =      .018040 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD             ID=11  CODE=1

                                    HYDROGRAPH FROM AREA   400.20


    RUNOFF VOLUME =     1.32159 INCHES     =      2.2707 ACRE-FEET
    PEAK DISCHARGE RATE =      67.80 CFS  AT   1.500 HOURS   BASIN AREA =   .0322 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 405.15 AND 400.2 TOGETHER TO GET THE FLOW
*S IN SAPPHIRE ST. @ ANALYSIS PT B
ADD HYD               ID=12 HYD NO=405.16  ID=10 ID=11
PRINT HYD             ID=12 CODE=1

                                    HYDROGRAPH FROM AREA   405.16


    RUNOFF VOLUME =     1.07830 INCHES     =     22.8114 ACRE-FEET
    PEAK DISCHARGE RATE =     607.35 CFS  AT   1.533 HOURS   BASIN AREA =   .3967 SQ. MI.


*S*************************************************************************
*S*************************************************************************
*S **BASINS 200,201, & 202 DRAIN TO KIMELA DR
COMPUTE NM HYD        ID=13 HYD NO=200.00 AREA=0.053 SQ MI
                      PER A=33 PER B=19 PER C=19 PER D=29
                      TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   60.682    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .015370 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   87.807    CFS   UNIT VOLUME =    .9999       B =   311.05      P60 = 1.8700
    AREA =      .037630 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD             ID=13   CODE=1
```

PARTIAL HYDROGRAPH 200.00

RUNOFF VOLUME = 1.00753 INCHES = 2.8479 ACRE-FEET
PEAK DISCHARGE RATE = 87.23 CFS AT 1.500 HOURS BASIN AREA = .0530 SQ. MI.

```
*S **ROUTE FLOW TO THE END OF KIMELA DR.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME  ID=14 REACH NO=1 NO VS=1 L=800 FT SLP=0.02
```

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.2055
.105	.554	.95	.1295
.158	1.246	2.80	.0988
.211	2.215	6.03	.0816
.263	3.461	10.94	.0703
.316	4.920	18.84	.0580
.368	6.394	29.08	.0489
.421	7.869	41.00	.0427
.474	9.344	54.46	.0381
.526	10.821	69.37	.0347
.579	12.298	85.66	.0319
.632	13.776	103.24	.0297

```
                                .684      15.261      119.89       .0283
                                .737      16.869      132.52       .0283
                                .790      18.644      147.34       .0281
                                .842      20.586      164.39       .0278
                                .895      22.695      183.72       .0275
                                .947      24.971      205.41       .0270
                               1.000      27.414      229.56       .0265
ROUTE                 ID=14 HYD NO=200.1 INFLOW ID=13 DT=0.0
PRINT HYD             ID=14 CODE=1

                                PARTIAL HYDROGRAPH   200.10

    RUNOFF VOLUME =      1.00753 INCHES      =       2.8479 ACRE-FEET
    PEAK DISCHARGE RATE =      86.94 CFS  AT   1.533 HOURS   BASIN AREA =   .0530 SQ. MI.


COMPUTE NM HYD        ID=15 HYD NO=201.00 AREA=0.026 SQ MI
                      PER A=33 PER B=19 PER C=19 PER D=29
                      TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   29.768    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 = 1.8700
    AREA =      .007540 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   43.075    CFS   UNIT VOLUME =    .9997       B =   311.05      P60 = 1.8700
    AREA =      .018460 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD             ID=15  CODE=1

                                PARTIAL HYDROGRAPH   201.00

    RUNOFF VOLUME =      1.00753 INCHES      =       1.3971 ACRE-FEET
    PEAK DISCHARGE RATE =      42.80 CFS  AT   1.500 HOURS   BASIN AREA =   .0260 SQ. MI.


ADD HYD               ID=16 HYD NO=201.1 ID=15 ID=14
PRINT HYD             ID=16 CODE=1

                                PARTIAL HYDROGRAPH   201.10

    RUNOFF VOLUME =      1.00752 INCHES      =       4.2450 ACRE-FEET
    PEAK DISCHARGE RATE =     128.91 CFS  AT   1.533 HOURS   BASIN AREA =   .0790 SQ. MI.


*S **BASIN 202 IS AN ELEMENTARY SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD        ID=17 HYD NO=202.00 AREA=0.009253 SQ MI
                      PER A=100 PER B=0 PER C=0 PER D=0
                      TP=-0.1333 HR   MASS RAIN=-1
```

```
    K =   .163684HR    TP =   .133300HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   18.988    CFS   UNIT VOLUME =    .9989       B =   273.54      P60 = 1.8700
    AREA =      .009253 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=17   CODE=1

                                PARTIAL HYDROGRAPH   202.00

    RUNOFF VOLUME =      .43925 INCHES     =        .2168 ACRE-FEET
    PEAK DISCHARGE RATE =       7.69 CFS  AT   1.533 HOURS   BASIN AREA =   .0093 SQ. MI.


*S **BASIN 202.05 IS THE ELEMENTARY SCHOOL PARKING LOT THAT WILL DRAIN TO KIMELA
COMPUTE NM HYD      ID=18  HYD NO=202.05 AREA=0.003747 SQ MI
                    PER A=0  PER B=0  PER C=0  PER D=100
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   14.793    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 = 1.8700
    AREA =      .003747 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=18  CODE=1

                                PARTIAL HYDROGRAPH   202.05

    RUNOFF VOLUME =     1.96548 INCHES     =        .3928 ACRE-FEET
    PEAK DISCHARGE RATE =      10.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0037 SQ. MI.


*S **ADD THE BASINS OF THE ELEMENTARY SCHOOL AND PARKING LOT
ADD HYD             ID=19  HYD NO=202.06 ID I=17  ID II=18
PRINT HYD           ID=19  CODE=1

                                PARTIAL HYDROGRAPH   202.06

    RUNOFF VOLUME =      .87913 INCHES     =        .6095 ACRE-FEET
    PEAK DISCHARGE RATE =      18.01 CFS  AT   1.500 HOURS   BASIN AREA =   .0130 SQ. MI.


*S **ADD THE BASINS TOGETHER TO GET THE FLOW IN KIMELA DR @ ANALYSIS PT C
ADD HYD             ID=20 HYD NO=202.1 ID=16 ID=19
PRINT HYD           ID=20 CODE=1

                                PARTIAL HYDROGRAPH   202.10

    RUNOFF VOLUME =      .98938 INCHES     =       4.8545 ACRE-FEET
    PEAK DISCHARGE RATE =     146.56 CFS  AT   1.533 HOURS   BASIN AREA =   .0920 SQ. MI.
```

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*S*************************************************************************
*S*************************************************************************
*S **BASINS 402 THRU 404 ARE CURRENTLY UNDEVELOPED, FOR PURPOSES
*S OF THIS REPORT, ASSUME ALL BASINS WILL BE BUILT OUT @ THEIR CURRENT
*S ZONING
*S **BASIN 402 IS UNIT 2 OF SUNRISE ESTATES
COMPUTE NM HYD       ID=6 HYD NO=402.00 AREA=0.052 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   86.225    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .021840 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   80.246    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =      .030160 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=6   CODE=1

                                    HYDROGRAPH FROM AREA   402.00


    RUNOFF VOLUME =     1.29860 INCHES     =       3.6014 ACRE-FEET
    PEAK DISCHARGE RATE =     108.14 CFS  AT   1.500 HOURS   BASIN AREA =   .0520 SQ. MI.


*S **ADD BASIN 402 TO THE TOTAL FLOW @ THE END OF EXTENDED KIMELA
ADD HYD              ID=7 HYD NO=402.1 ID=20 ID=6
PRINT HYD            ID=7 CODE=1

                                    HYDROGRAPH FROM AREA   402.10


    RUNOFF VOLUME =     1.10104 INCHES     =       8.4559 ACRE-FEET
    PEAK DISCHARGE RATE =     251.21 CFS  AT   1.533 HOURS   BASIN AREA =   .1440 SQ. MI.


*S **COMPUTE HYDROGRAPH FOR BASIN 404
COMPUTE NM HYD       ID=8 HYD NO=404.00 AREA=0.0108 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   17.908    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004536 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   16.666    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =      .006264 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
PRINT HYD            ID=8   CODE=1

                                        HYDROGRAPH FROM AREA   404.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .7480 ACRE-FEET
    PEAK DISCHARGE RATE =      22.47 CFS  AT   1.500 HOURS   BASIN AREA =   .0108 SQ. MI.


*S **ADD FLOW TO THAT IN KIMELA DR
ADD HYD              ID=9 HYD NO=404.1 ID=7 ID=8
PRINT HYD            ID=9 CODE=1

                                        HYDROGRAPH FROM AREA   404.10

    RUNOFF VOLUME =      1.11482 INCHES      =        9.2039 ACRE-FEET
    PEAK DISCHARGE RATE =     272.95 CFS  AT   1.533 HOURS   BASIN AREA =   .1548 SQ. MI.


*S **COMPUTE HYDROGRAPH FOR BASIN 408A
COMPUTE NM HYD       ID=10 HYD NO=408A AREA=0.01175 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   19.484    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004935 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   18.133    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =      .006815 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=10   CODE=1

                                        HYDROGRAPH FROM AREA 408A

    RUNOFF VOLUME =      1.29860 INCHES      =         .8138 ACRE-FEET
    PEAK DISCHARGE RATE =      24.45 CFS  AT   1.500 HOURS   BASIN AREA =   .0118 SQ. MI.


*S **COMBINE FLOWS FROM HYDROGRAPH NO. 404.1 AND 408A
ADD HYD              ID=11 HYD NO=408.1 ID=9 ID=10
PRINT HYD            ID=11 CODE=1

                                        HYDROGRAPH FROM AREA   408.10

    RUNOFF VOLUME =      1.12778 INCHES      =       10.0177 ACRE-FEET
    PEAK DISCHARGE RATE =     296.74 CFS  AT   1.500 HOURS   BASIN AREA =   .1666 SQ. MI.
```

```
*S **ADD TO FLOW IN SAPPHIRE ST @ ANALYSIS PT D
ADD HYD              ID=13 HYD NO=404.2 ID=11 ID=12
PRINT HYD            ID=13 CODE=1
```

HYDROGRAPH FROM AREA 404.20

RUNOFF VOLUME = 1.09293 INCHES = 32.8291 ACRE-FEET
PEAK DISCHARGE RATE = 903.96 CFS AT 1.533 HOURS BASIN AREA = .5632 SQ. MI.

```
*S DESIGN A RETENTION FACILITY TO REDUCE TO FLOW TO THAT WHICH WILL
*S FIT IN A 48" RCP @ S=1.8%
ROUTE RESERVOIR      ID=14 HYD NO=405.4 INFLOW ID=13 CODE=1
```

OUTFLOW(CFS)	STORAGE(AF)	ELEV(FT)
0	0	0
46.2	0.77	0.5
104.75	1.91	1
120.95	3.93	2
135.23	6.06	3
148.14	8.30	4
160.00	10.66	5
171.05	13.14	6
181.43	15.74	7
191.24	18.47	8
200.58	21.33	9
209.50	24.32	10
218.05	27.44	11

* * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	.00	.000	.00
.03	.00	.00	.000	.00
.07	.00	.00	.000	.00
.10	.00	.00	.000	.00
.13	.00	.00	.000	.00
.17	.00	.00	.000	.00
.20	.00	.00	.000	.00
.23	.00	.00	.000	.00
.27	.00	.00	.000	.00
.30	.00	.00	.000	.00
.33	.00	.00	.000	.00
.37	.00	.00	.000	.00
.40	.00	.00	.000	.00
.43	.00	.00	.000	.00
.47	.00	.00	.000	.00
.50	.00	.00	.000	.00
.53	.00	.00	.000	.00
.57	.00	.00	.000	.00
.60	.00	.00	.000	.00
.63	.00	.00	.000	.00
.67	.00	.00	.000	.00
.70	.00	.00	.000	.00
.73	.00	.00	.000	.00
.77	.00	.00	.000	.00

.80	.00	.00	.000	.00
.83	.00	.00	.000	.00
.87	.00	.00	.000	.00
.90	.00	.00	.000	.00
.93	.00	.00	.000	.00
.97	.00	.00	.000	.00
1.00	.00	.00	.000	.00
1.03	.00	.00	.000	.00
1.07	.00	.00	.000	.00
1.10	.00	.00	.000	.00
1.13	.04	.00	.000	.00
1.17	.77	.00	.001	.06
1.20	5.15	.01	.008	.51
1.23	16.56	.02	.035	2.09
1.27	36.33	.06	.097	5.81
1.30	66.30	.14	.213	12.75
1.33	114.81	.27	.411	24.63
1.37	201.14	.49	.750	44.99
1.40	342.69	.75	1.333	75.13
1.43	535.28	1.19	2.291	107.80
1.47	720.78	1.89	3.708	119.17
1.50	856.38	2.75	5.535	131.71
1.53	903.96	3.68	7.579	143.99
1.57	873.35	4.56	9.616	154.75
1.60	798.66	5.33	11.480	163.65
1.63	711.18	5.98	13.099	170.87
1.67	623.41	6.51	14.459	176.31
1.70	552.69	6.94	15.587	180.82
1.73	471.38	7.28	16.494	184.14
1.77	404.17	7.53	17.190	186.64
1.80	351.19	7.72	17.713	188.52
1.83	308.64	7.86	18.101	189.91

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
1.87	273.30	7.97	18.378	190.91
1.90	243.58	8.03	18.563	191.54
1.93	219.44	8.07	18.673	191.90
1.97	200.05	8.09	18.721	192.06
2.00	184.17	8.09	18.722	192.06
2.03	170.67	8.07	18.681	191.93
2.07	156.33	8.05	18.604	191.68
2.10	138.59	8.00	18.482	191.28
2.13	119.00	7.94	18.311	190.67
2.17	100.73	7.86	18.089	189.87
2.20	85.81	7.76	17.825	188.92
2.23	74.12	7.65	17.526	187.85
2.27	64.97	7.54	17.202	186.68
2.30	57.75	7.41	16.858	185.45
2.33	51.96	7.28	16.500	184.16
2.37	47.13	7.14	16.131	182.84
2.40	42.97	7.01	15.754	181.48
2.43	39.31	6.86	15.369	179.95
2.47	36.02	6.71	14.979	178.39
2.50	33.05	6.56	14.585	176.82
2.53	30.43	6.40	14.188	175.23
2.57	28.11	6.25	13.788	173.64
2.60	26.01	6.09	13.386	172.03

2.63	24.09	5.94	12.984	170.35
2.67	22.35	5.77	12.581	168.56
2.70	20.77	5.61	12.179	166.77
2.73	19.31	5.45	11.777	164.98
2.77	17.97	5.29	11.376	163.19
2.80	16.75	5.13	10.977	161.41
2.83	15.63	4.97	10.580	159.60
2.87	14.60	4.80	10.184	157.61
2.90	13.63	4.63	9.792	155.64
2.93	12.74	4.47	9.402	153.68
2.97	11.93	4.30	9.015	151.74
3.00	11.18	4.14	8.632	149.81
3.03	10.49	3.98	8.252	147.86
3.07	9.89	3.81	7.876	145.69
3.10	9.32	3.64	7.504	143.55
3.13	8.78	3.48	7.136	141.43
3.17	8.30	3.32	6.773	139.34
3.20	7.87	3.16	6.414	137.27
3.23	7.47	3.00	6.060	135.23
3.27	7.12	2.84	5.711	132.89
3.30	6.79	2.67	5.367	130.58
3.33	6.47	2.52	5.029	128.32
3.37	6.19	2.36	4.696	126.08
3.40	5.93	2.21	4.368	123.89
3.43	5.69	2.05	4.046	121.73
3.47	5.47	1.90	3.729	119.34
3.50	5.26	1.75	3.419	116.85
3.53	5.07	1.60	3.115	114.41
3.57	4.89	1.45	2.816	112.02
3.60	4.73	1.30	2.524	109.68
3.63	4.59	1.16	2.238	107.38
3.67	4.47	1.02	1.958	105.14
3.70	4.34	.91	1.696	93.77

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
3.73	4.21	.81	1.466	81.94
3.77	4.09	.72	1.266	71.67
3.80	3.99	.64	1.092	62.73
3.83	3.90	.57	.941	54.96
3.87	3.82	.52	.809	48.21
3.90	3.75	.45	.696	41.74
3.93	3.67	.39	.599	35.94
3.97	3.60	.34	.517	31.01
4.00	3.54	.29	.447	26.82
4.03	3.49	.25	.388	23.26
4.07	3.43	.22	.337	20.24
4.10	3.39	.19	.294	17.67
4.13	3.36	.17	.258	15.49
4.17	3.32	.15	.227	13.63
4.20	3.28	.13	.201	12.05
4.23	3.23	.12	.179	10.71
4.27	3.18	.10	.159	9.56
4.30	3.16	.09	.143	8.59
4.33	3.14	.08	.129	7.76
4.37	3.12	.08	.118	7.05
4.40	3.09	.07	.107	6.45
4.43	3.08	.06	.099	5.94

4.47	3.05	.06	.092	5.50
4.50	3.03	.06	.085	5.12
4.53	3.02	.05	.080	4.80
4.57	3.01	.05	.075	4.53
4.60	3.00	.05	.072	4.30
4.63	2.99	.04	.068	4.10
4.67	2.98	.04	.065	3.93
4.70	2.98	.04	.063	3.78
4.73	2.99	.04	.061	3.66
4.77	3.00	.04	.059	3.56
4.80	3.00	.04	.058	3.47
4.83	3.00	.04	.057	3.40
4.87	2.99	.04	.056	3.34
4.90	2.99	.04	.055	3.29
4.93	2.99	.04	.054	3.24
4.97	2.99	.03	.053	3.20
5.00	3.01	.03	.053	3.17
5.03	3.02	.03	.052	3.15
5.07	3.04	.03	.052	3.13
5.10	3.06	.03	.052	3.12
5.13	3.09	.03	.052	3.11
5.17	3.09	.03	.052	3.11
5.20	3.09	.03	.052	3.11
5.23	3.10	.03	.052	3.10
5.27	3.13	.03	.052	3.11
5.30	3.16	.03	.052	3.11
5.33	3.18	.03	.052	3.12
5.37	3.20	.03	.052	3.13
5.40	3.21	.03	.052	3.14
5.43	3.22	.03	.053	3.15
5.47	3.23	.03	.053	3.16
5.50	3.25	.03	.053	3.17
5.53	3.30	.03	.053	3.19
5.57	3.32	.03	.053	3.21

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
5.60	3.33	.03	.054	3.23
5.63	3.34	.04	.054	3.24
5.67	3.37	.04	.054	3.26
5.70	3.40	.04	.055	3.28
5.73	3.42	.04	.055	3.30
5.77	3.44	.04	.055	3.32
5.80	3.47	.04	.056	3.34
5.83	3.50	.04	.056	3.36
5.87	3.52	.04	.056	3.39
5.90	3.55	.04	.057	3.41
5.93	3.58	.04	.057	3.43
5.97	3.62	.04	.058	3.46
6.00	3.64	.04	.058	3.48
6.03	3.66	.04	.058	3.51
6.07	3.54	.04	.059	3.52
6.10	3.20	.04	.058	3.50
6.13	2.72	.04	.057	3.42
6.17	2.26	.04	.055	3.27
6.20	1.88	.03	.052	3.09
6.23	1.59	.03	.048	2.88
6.27	1.37	.03	.044	2.67

6.30	1.20	.03	.041	2.46
6.33	1.07	.02	.038	2.26
6.37	.96	.02	.034	2.07
6.40	.87	.02	.032	1.89
6.43	.79	.02	.029	1.73
6.47	.71	.02	.026	1.58
6.50	.65	.02	.024	1.44
6.53	.59	.01	.022	1.32
6.57	.53	.01	.020	1.20
6.60	.49	.01	.018	1.10
6.63	.44	.01	.017	1.00
6.67	.40	.01	.015	.91
6.70	.37	.01	.014	.83
6.73	.34	.01	.013	.76
6.77	.31	.01	.012	.69
6.80	.28	.01	.011	.63
6.83	.26	.01	.010	.58
6.87	.23	.01	.009	.53
6.90	.21	.01	.008	.48
6.93	.19	.00	.007	.44
6.97	.17	.00	.007	.40
7.00	.16	.00	.006	.36
7.03	.15	.00	.006	.33
7.07	.13	.00	.005	.30
7.10	.12	.00	.005	.27
7.13	.11	.00	.004	.25
7.17	.10	.00	.004	.23
7.20	.09	.00	.003	.21
7.23	.08	.00	.003	.19
7.27	.08	.00	.003	.17
7.30	.07	.00	.003	.16
7.33	.06	.00	.002	.14
7.37	.06	.00	.002	.13
7.40	.05	.00	.002	.12
7.43	.05	.00	.002	.11

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
7.47	.04	.00	.002	.10
7.50	.04	.00	.002	.09
7.53	.04	.00	.001	.08
7.57	.03	.00	.001	.08
7.60	.03	.00	.001	.07
7.63	.03	.00	.001	.06
7.67	.02	.00	.001	.06
7.70	.02	.00	.001	.05
7.73	.02	.00	.001	.05
7.77	.02	.00	.001	.04
7.80	.02	.00	.001	.04
7.83	.01	.00	.001	.04
7.87	.01	.00	.001	.03
7.90	.01	.00	.000	.03
7.93	.01	.00	.000	.03
7.97	.01	.00	.000	.02
8.00	.01	.00	.000	.02
8.03	.01	.00	.000	.02
8.07	.01	.00	.000	.02
8.10	.01	.00	.000	.02

8.13	.01	.00	.000	.01
8.17	.01	.00	.000	.01
8.20	.00	.00	.000	.01
8.23	.00	.00	.000	.01
8.27	.00	.00	.000	.01
8.30	.00	.00	.000	.01
8.33	.00	.00	.000	.01
8.37	.00	.00	.000	.01
8.40	.00	.00	.000	.01
8.43	.00	.00	.000	.01
8.47	.00	.00	.000	.01
8.50	.00	.00	.000	.01
8.53	.00	.00	.000	.00

PEAK DISCHARGE = 192.062 CFS - PEAK OCCURS AT HOUR 2.00
MAXIMUM WATER SURFACE ELEVATION = 8.088
MAXIMUM STORAGE = 18.7216 AC-FT INCREMENTAL TIME= .033330HRS

*S ROUTE FLOW FROM THE DETENTION POND TO THE AMOLE DEL NORTE CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLOPE=0.0180
DIA=4.0 FT N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.21	.25	1.01	1.78
.42	.69	4.39	2.44
.63	1.25	10.20	2.91
.83	1.90	18.35	3.25
1.04	2.60	28.65	3.51
1.25	3.36	40.88	3.71
1.46	4.15	54.76	3.85
1.67	4.96	70.02	3.94
1.88	5.79	86.31	3.99
2.08	6.62	103.30	4.00
2.29	7.45	120.60	4.00
2.50	8.27	137.80	4.00
2.71	9.06	154.44	4.00
2.92	9.82	170.03	4.00
3.13	10.54	183.98	4.00
3.34	11.20	195.59	4.00
3.54	11.77	203.89	4.00
3.75	12.24	207.31	4.00
4.00	12.57	207.31	4.00

COMPUTE TRAVEL TIME ID=15 REACH NO=1 NO VS=1 L=1150 FT SLP=0.018

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	1.01	.0789
.417	.695	4.39	.0506
.625	1.255	10.20	.0393
.834	1.898	18.35	.0330
1.042	2.604	28.65	.0290
1.251	3.358	40.88	.0262

```
                    1.459       4.146       54.76       .0242
                    1.668       4.960       70.02       .0226
                    1.876       5.788       86.31       .0214
                    2.084       6.621      103.30       .0205
                    2.293       7.451      120.60       .0197
                    2.501       8.267      137.80       .0192
                    2.710       9.062      154.44       .0187
                    2.918       9.823      170.03       .0185
                    3.127      10.539      183.98       .0183
                    3.335      11.195      195.59       .0183
                    3.544      11.773      203.89       .0184
                    3.752      12.243      207.31       .0189
                    4.000      12.566      207.31       .0194
ROUTE          ID=15 HYD NO=405.3 INFLOW ID=14 DT=0.0
PRINT HYD      ID=15 CODE=1

                          HYDROGRAPH FROM AREA   405.30

    RUNOFF VOLUME =     1.09293 INCHES     =      32.8291 ACRE-FEET
    PEAK DISCHARGE RATE =     192.05 CFS  AT   2.000 HOURS   BASIN AREA =   .5632 SQ. MI.


*S*************************************************************************
*S*************************************************************************
*S **CALC BASIN 406
COMPUTE NM HYD      ID=16 HYD NO=406.00 AREA=0.057434 SQ MI
                    PER A=4 PER B=27 PER C=27 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   95.236    CFS   UNIT VOLUME =    .9993       B =   526.28      P60 = 1.8700
    AREA =      .024122 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .121550HR    TP =   .133300HR    K/TP RATIO =   .911856     SHAPE CONSTANT, N =  3.883611
    UNIT PEAK =   86.799    CFS   UNIT VOLUME =   1.000       B =   347.33      P60 = 1.8700
    AREA =      .033312 SQ MI    IA =    .44052 INCHES    INF =   1.08345 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=16   CODE=1

                          HYDROGRAPH FROM AREA   406.00

    RUNOFF VOLUME =     1.27968 INCHES     =       3.9198 ACRE-FEET
    PEAK DISCHARGE RATE =     117.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0574 SQ. MI.


*S **CALC BASIN 407
COMPUTE NM HYD      ID=17 HYD NO=407.00 AREA=0.0504 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   83.572    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
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```
    AREA =       .021168 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442    SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    77.777    CFS    UNIT VOLUME =    1.000       B =   354.67       P60 = 1.8700
    AREA =       .029232 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=17   CODE=1

                                    HYDROGRAPH FROM AREA   407.00

    RUNOFF VOLUME =     1.29860 INCHES      =       3.4906 ACRE-FEET
    PEAK DISCHARGE RATE =     104.81 CFS  AT   1.500 HOURS   BASIN AREA =    .0504 SQ. MI.


*S **CALC BASIN 408B
COMPUTE NM HYD       ID=18  HYD NO=408B  AREA=0.09501 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =    .073200HR    TP =    .133300HR    K/TP RATIO =    .549137    SHAPE CONSTANT, N =  7.037955
    UNIT PEAK =    156.58    CFS    UNIT VOLUME =    .9993       B =   523.05       P60 = 1.8700
    AREA =       .039904 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

    K =    .117566HR    TP =    .133300HR    K/TP RATIO =    .881962    SHAPE CONSTANT, N =  4.023900
    UNIT PEAK =    147.48    CFS    UNIT VOLUME =    1.000       B =   356.76       P60 = 1.8700
    AREA =       .055106 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=18  CODE=1

                                    HYDROGRAPH FROM AREA 408B

    RUNOFF VOLUME =     1.29860 INCHES      =       6.5802 ACRE-FEET
    PEAK DISCHARGE RATE =     197.65 CFS  AT   1.500 HOURS   BASIN AREA =    .0950 SQ. MI.


*S **CALC BASIN 408C
COMPUTE NM HYD       ID=19  HYD NO=408C  AREA=0.0506 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000    SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    83.904    CFS    UNIT VOLUME =    .9992       B =   526.28       P60 = 1.8700
    AREA =       .021252 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442    SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    78.086    CFS    UNIT VOLUME =    1.000       B =   354.67       P60 = 1.8700
    AREA =       .029348 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
```

```
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330
PRINT HYD            ID=19  CODE=1

                                    HYDROGRAPH FROM AREA 408C

    RUNOFF VOLUME =      1.29860 INCHES      =        3.5045 ACRE-FEET
    PEAK DISCHARGE RATE =      105.23 CFS  AT    1.500 HOURS   BASIN AREA =    .0506 SQ. MI.


*S **COMBINE FLOWS FROM BASIN 408B AND 408C
ADD HYD              ID=20 HYD NO=408.2 ID=18 ID=19
PRINT HYD            ID=20 CODE=1

                                    HYDROGRAPH FROM AREA   408.20

    RUNOFF VOLUME =      1.29859 INCHES      =       10.0846 ACRE-FEET
    PEAK DISCHARGE RATE =      302.87 CFS  AT    1.500 HOURS   BASIN AREA =    .1456 SQ. MI.


*S*************************************************************************
*S*************************************************************************
*S **BASIN 500 IS UNIT ONE OF THE PROPOSED LONGFORD SD
COMPUTE NM HYD       ID=1 HYD NO=500.00 AREA=0.024905 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    41.297    CFS   UNIT VOLUME =     .9991        B =    526.28      P60 = 1.8700
    AREA =       .010460 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    38.433    CFS   UNIT VOLUME =    1.000        B =    354.67      P60 = 1.8700
    AREA =       .014445 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=1   CODE=1

                                 OUTFLOW HYDROGRAPH RESERVOIR   500.00

    RUNOFF VOLUME =      1.29860 INCHES      =        1.7249 ACRE-FEET
    PEAK DISCHARGE RATE =       51.80 CFS  AT    1.500 HOURS   BASIN AREA =    .0249 SQ. MI.


*S **BASIN 501 IS THE AREA PROPOSED AS FUTURE LONGFORD SD DRAINING
*S **DIRECTLY TO THE AMOLE CHANNEL
COMPUTE NM HYD       ID=2 HYD NO=501.00 AREA=0.03663 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
```

```
    UNIT PEAK =    60.739    CFS   UNIT VOLUME =    .9992        B =   526.28      P60 = 1.8700
    AREA =       .015385 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    56.527    CFS   UNIT VOLUME =    1.000        B =   354.67      P60 = 1.8700
    AREA =       .021245 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=2   CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   501.00

    RUNOFF VOLUME =     1.29860 INCHES     =       2.5369 ACRE-FEET
    PEAK DISCHARGE RATE =      76.18 CFS  AT   1.500 HOURS   BASIN AREA =   .0366 SQ. MI.


*S **COMBINE BASINS 500 AND 501 TOGETHER TO REPRESENT THE NORTHERN PART OF THE
*S **LONGFORD SD
ADD HYD             ID=3  HYD NO=501.1  ID I=1  ID II=2
PRINT HYD           ID=3  CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   501.10

    RUNOFF VOLUME =     1.29859 INCHES     =       4.2618 ACRE-FEET
    PEAK DISCHARGE RATE =     127.98 CFS  AT   1.500 HOURS   BASIN AREA =   .0615 SQ. MI.


*S **BASIN 502 IS THE SOUTHERN PART OF THE LONGFORD SD
COMPUTE NM HYD      ID=4 HYD NO=502.00 AREA=0.05788 SQ MI
                    PER A=0 PER B=28 PER C=28 PER D=44
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   100.55    CFS   UNIT VOLUME =    .9993        B =   526.28      P60 = 1.8700
    AREA =       .025467 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    86.240    CFS   UNIT VOLUME =    1.000        B =   354.67      P60 = 1.8700
    AREA =       .032413 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=4  CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   502.00

    RUNOFF VOLUME =     1.32159 INCHES     =       4.0796 ACRE-FEET
    PEAK DISCHARGE RATE =     121.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0579 SQ. MI.
```

```
*S **BASIN 503 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S **A DENSITY OF 4 DU/AC. THE DISCHARGE FROM THIS BASIN DRAINS TO THE AMOLE
*S DEL NORTE CHANNEL AND DOES NOT AFFECT THE ARENAL/UNSER DRAINAGE MANAGEMENT
*S SITE.
COMPUTE NM HYD       ID=5 HYD NO=503.00 AREA=0.03752 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   62.215    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .015758 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   57.901    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =      .021762 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=5  CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   503.00


    RUNOFF VOLUME =     1.29860 INCHES     =       2.5986 ACRE-FEET
    PEAK DISCHARGE RATE =      78.03 CFS  AT   1.500 HOURS   BASIN AREA =   .0375 SQ. MI.


*S*************************************************************************
*S **BASIN 504 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S **A DENSITY OF 4 DU/AC. THE DISCHARGE FROM THIS BASIN TRAVEL ALONG SAGE RD.
*S AND ENTERS THE AMOLE DEL NORTE CHANNEL, DOES NOT AFFECT THE ARENAL/UNSER
*S DRAINAGE MANAGEMENT SITE.
COMPUTE NM HYD       ID=6 HYD NO=504.00 AREA=0.036668 MI
                     PER A=0 PER B=28 PER C=28 PER D=44
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   63.698    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .016134 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   54.635    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =      .020534 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=6  CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   504.00


    RUNOFF VOLUME =     1.32159 INCHES     =       2.5845 ACRE-FEET
    PEAK DISCHARGE RATE =      77.16 CFS  AT   1.500 HOURS   BASIN AREA =   .0367 SQ. MI.
```

```
*S **BASIN 505 IS FULLY DEVELOPED AND DRAINS SOUTH TO BLAKE RD..DISCHARGE FROM
*S THIS BASIN DOES NOT AFFECT THE ARENAL/UNSER DRAINAGE MANAGEMENT SITE.
COMPUTE NM HYD       ID=7 HYD NO=505.00 AREA=0.02618 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   29.974    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 = 1.8700
    AREA =      .007592 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   43.373    CFS   UNIT VOLUME =    .9997       B =   311.05      P60 = 1.8700
    AREA =      .018588 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=7   CODE=1

                                 OUTFLOW HYDROGRAPH RESERVOIR   505.00


    RUNOFF VOLUME =     1.00753 INCHES      =       1.4068 ACRE-FEET
    PEAK DISCHARGE RATE =      43.10 CFS  AT   1.500 HOURS   BASIN AREA =   .0262 SQ. MI.


FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 14:22:43
```

APPENDIX C

UNSER. BLVD. 10 YR DRY LANE STUDY

SUBJECT: **Unser Blvd. Dry Lane Analysis**

CRITERIA: 10-year Storm (AHYMO 1994)

SOLUTION: Storm drains shall be situated on the east side of Unser Blvd. for that portion of roadway from Freshwater Road to the end of Unit One Subdivision. A stub will be provided to collect storm water from Tract E, Albuquerque South Unit 1 when it is developed. Runoff onto the west and east lanes shall be based upon each lane having a contributing cross-section width of 50 feet. The 56-foot wide median shall be designed as having temporary storm water retention incorporated into the design (see attached exhibit). Storm drain inlet location shall allow for one "dry" lane in the event of the 10-year storm. The temporary median retention improvements may be abandoned when Unser Blvd. is expanded to six (6) lanes and the median is reconstructed with permanent improvements such as a paved surface and/or median landscaping. The "dry" lane is achieved on the median lane and the increase in storm water flows is carried by the original 25-foot wide driving lanes.

UNSER BLVD. DRY LANE STUDY

CRITERIA : 10 YR STORM
AHYMO (1994)

METHODOLOGY : USING CHART 3 AND 4 (ATTACHED)
"FLOW IN TRIANGULAR SECTIONS"

$Q = Q_s / (1 - E_o)$

WHERE $E_o = 0.44$ (CHART 4)

AND $Q_s = 2.6$ CFS

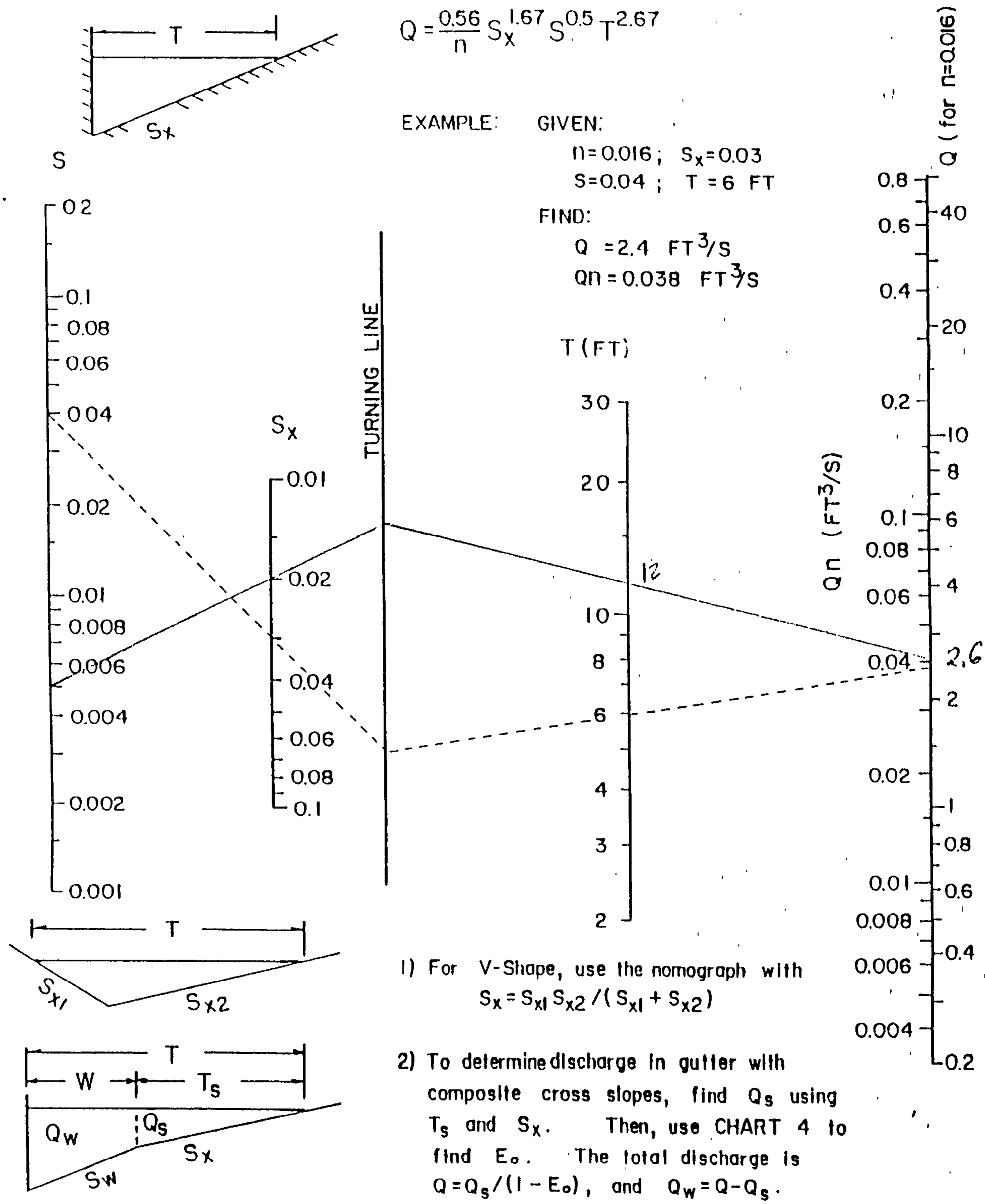
$\therefore Q = 2.6/(1 - 0.44) = 4.64$ cfs = CURB LANE STORM WATER CARRYING CAPACITY

DATA : AREA WITHIN BASIN 120.2
TOTAL LENGTH : 1650 FT
WIDTH (WEST R/W TO MED. CURB) = 50'

FROM AHYMO : $Q_{100} = 6.5$ cfs
$Q_{10} = 3.9$ cfs < 4.64 cfs $\therefore$ O.K.
$d_{10} = 0.33$

Q_{10} CAPTURED FROM INLET = 1.9 cfs

Q_{10} bypass = 3.9 - 1.9 = 2.0 cfs



$$Q = \frac{0.56}{n} S_x^{1.67} S^{0.5} T^{2.67}$$

EXAMPLE: GIVEN:

$n = 0.016$; $S_x = 0.03$

$S = 0.04$; $T = 6$ FT

FIND:

$Q = 2.4$ FT^3/S

$Qn = 0.038$ FT^3/S

1) For V-Shape, use the nomograph with $S_x = S_{x1} S_{x2} / (S_{x1} + S_{x2})$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use CHART 4 to find E_o. The total discharge is $Q = Q_s / (1 - E_o)$, and $Q_w = Q - Q_s$.

CHART 3. Flow in triangular gutter sections.

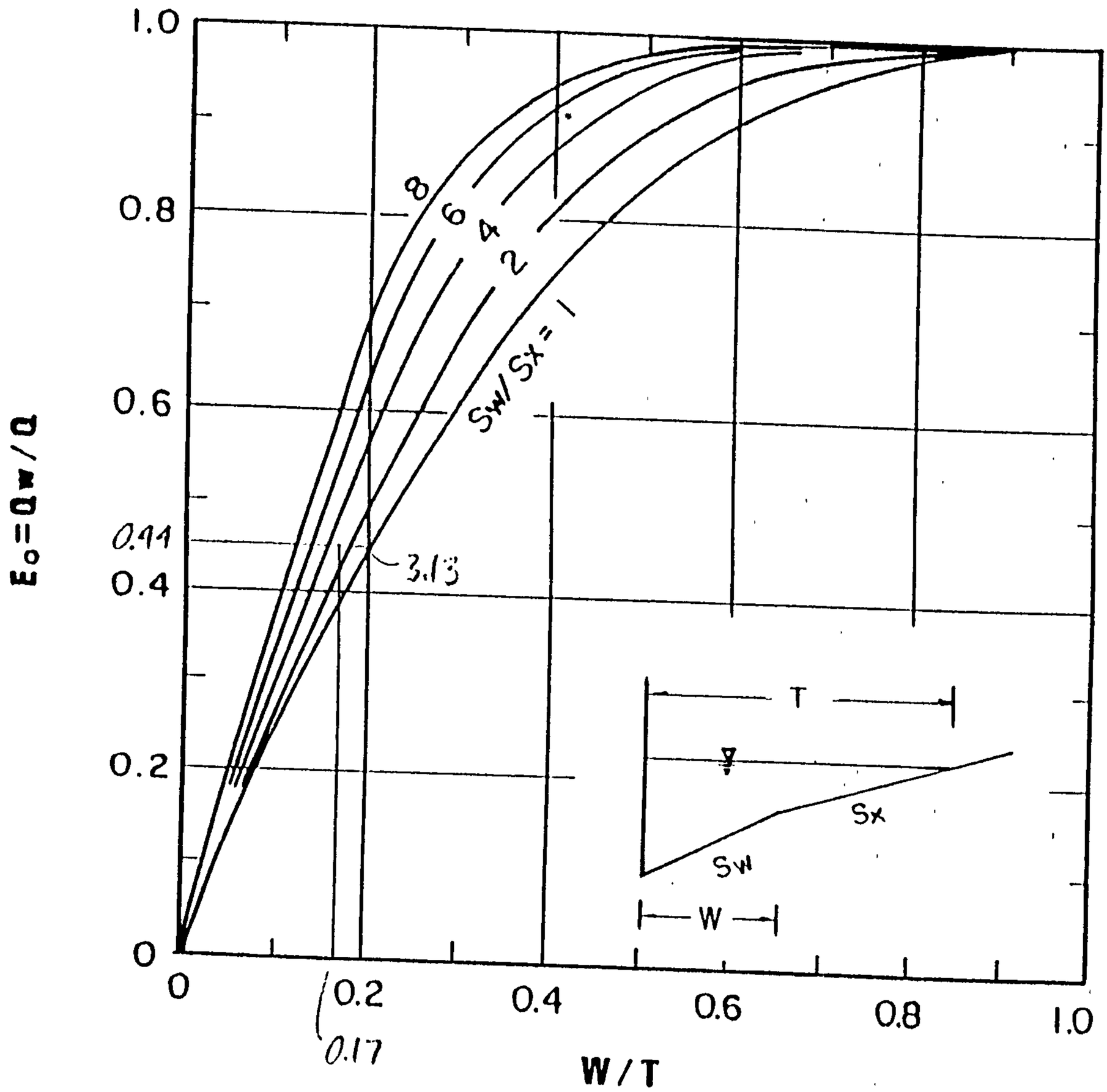
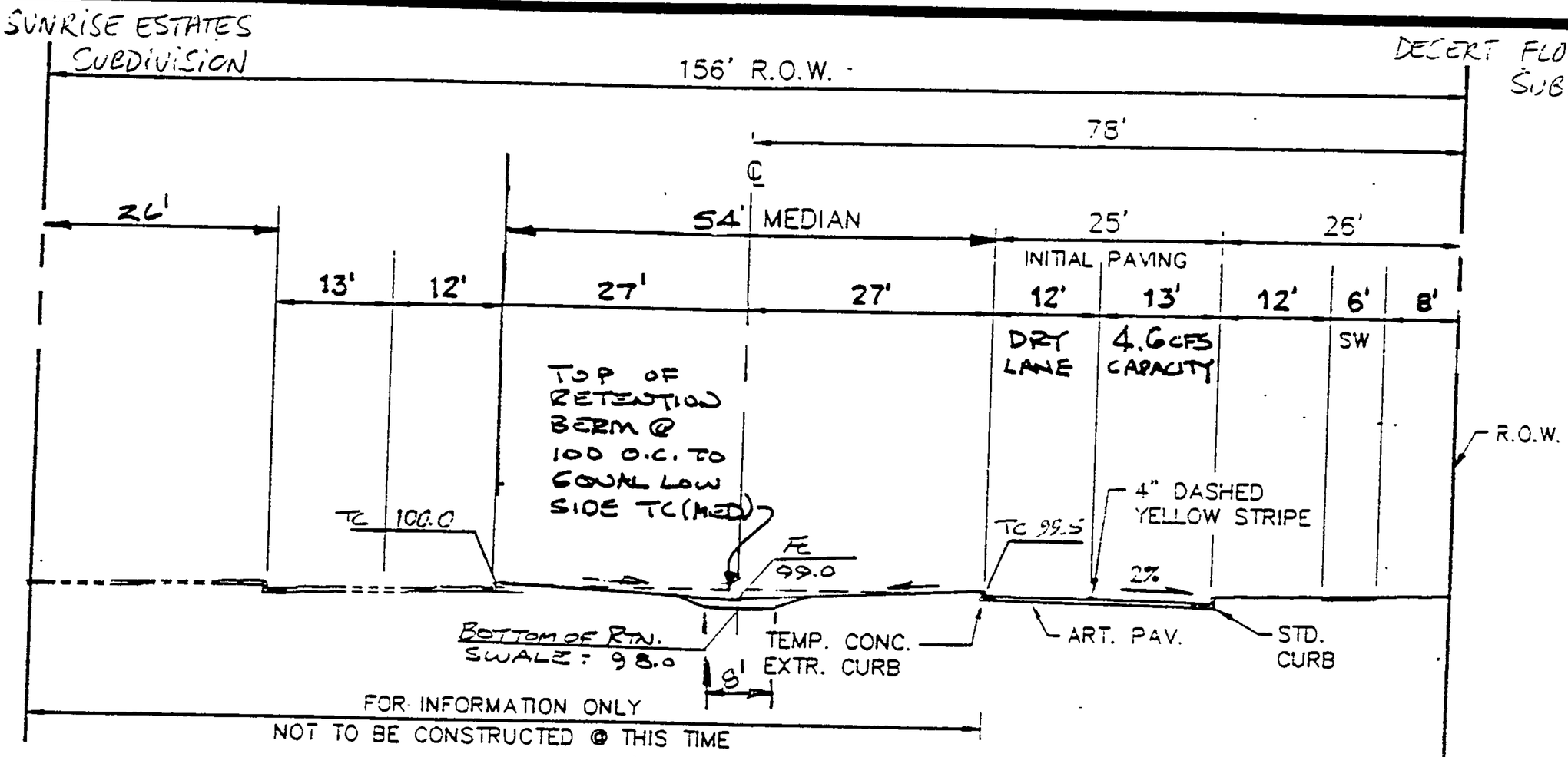


CHART 4. Ratio of frontal flow to total gutter flow.



INITIAL PAVING SECTION

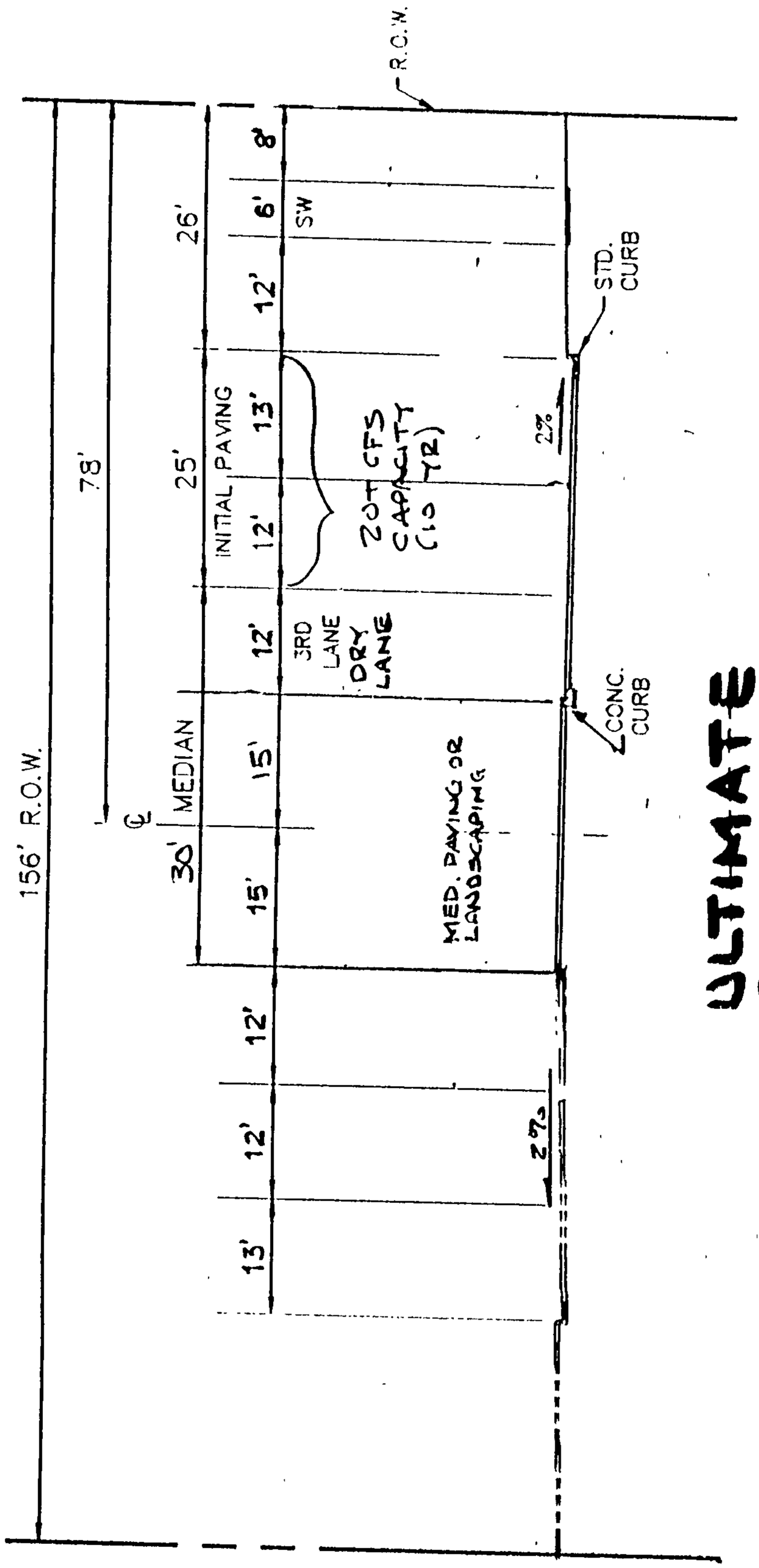
UNSER BLVD

SCALE: 1"=20'

ISAACSON & ARFMAN, P.A.

SUBJECT UNSER BLVD. JOB NO.

BY FCA DATE 6/97 SHEET NO. OF



ULTIMATE PAVING SECTION

UNSER BLVD

SCALE: 1"=20'

ISAACSON & ARFMAN, P.A.

SUBJECT _____ JOB NO. ____

BY _____ DATE _____ SHEET NO. ____ OF ____

APPENDIX D

DISCHARGE TO THE AMOLE DEL NORTE CHANNEL
REFERNCE; ARENAL\UNSER DRAINAGE MANAGMENT PLAN

This section contains pertinent information taken from the Arenal/Unser Drainage Management Plan of June 1997 regarding controlled flows of the site into the Amole del Norte Channel. Below is a Summary of the contents in the report with emphasis on how it applies to the Desert Flower Master Report. The report starts with the vicinity map of the plan site. Followed is the introduction, the plan sponsors and participants, and the proposed drainage solution, to give a broad view of the Plan report.

The appendix section contains the original subbasin map taken from Boyle Engineering Report. Subbasins 32D-36D and 38D were converted to subbasins 100-505 in the Arenal/Unser Drainage Management Plan. In this report, Desert Flower Master Drainage Report, subbasin 408 is broken down into subbasins 408A, 408B and 408C. The storm water generated is the same before and after subbasin 408 was adjusted.

Table 1 shows the original hydrograph data of the Amole del Norte Channel by Boyle Engineering. Table 2 shows the new hydrograph data of the channel. Followed is a graph from the two tables of the discharge into the channel at different times. The graph shows that the peak discharge of the new hydrograph is lower than the previous hydrograph's peak discharge; therefore, the allowed controlled discharges into the channel do not exceed the capacity the Channel was built for. Concluding this section is the hydrograph computation of basin 408.

The intent of this section is to give a general view of the Unser/Arenal Drainage report and how it applies to the Desert Flower Master Drainage Report. Therefore, it contains only relevant data. Referencing to the original Arenal/Unser Drainage Management Plan should be made for a full understanding of the report.

TABLE OF CONTENTS

Vicinity Map

I. Introduction

II. Plan Sponsors and Participants

III. Proposed Drainage Management Plan Solution

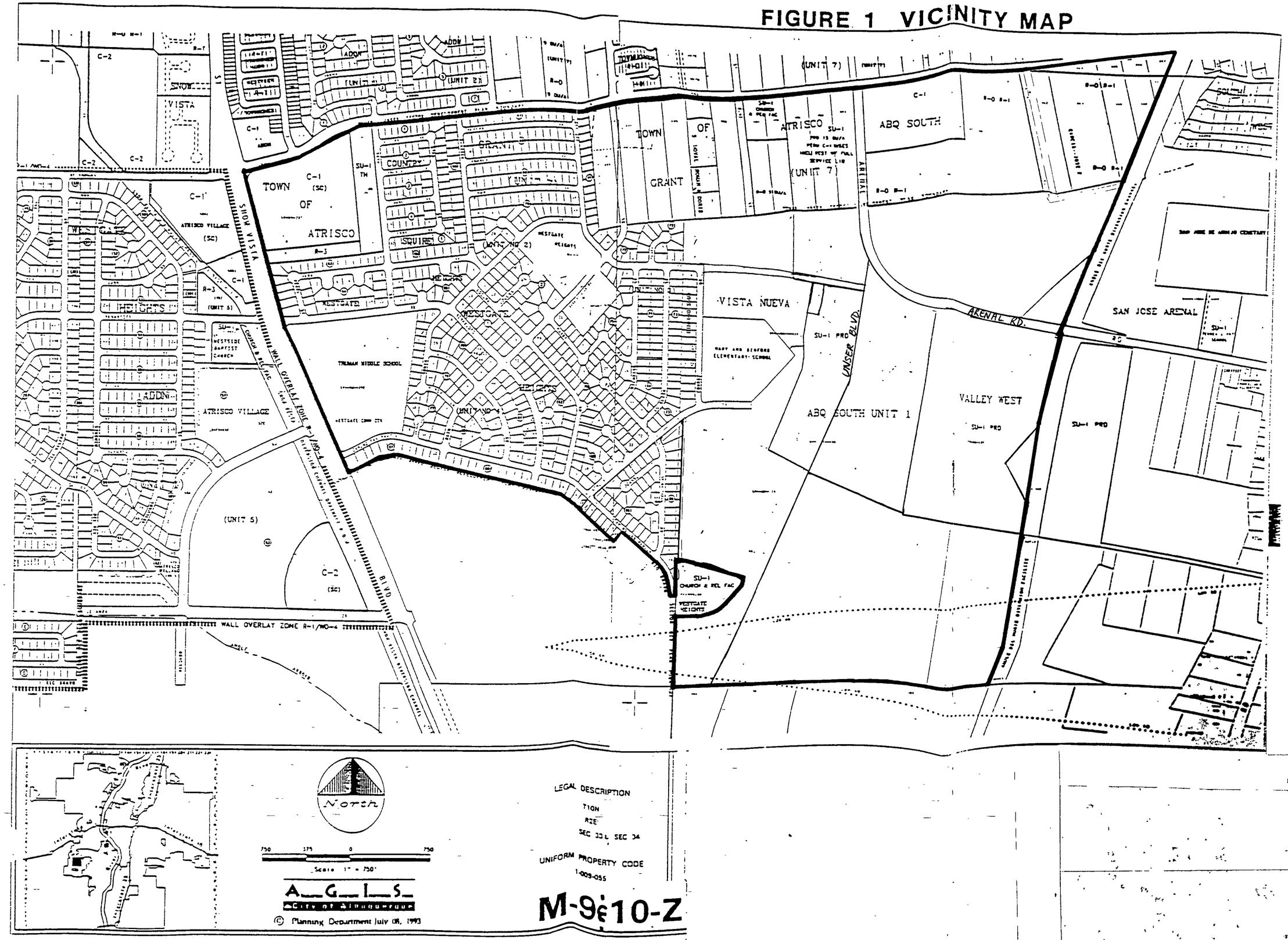
IV. The Plan

Appendices

BEC Subbasin Maps
Table 1: Previous Hydrograph Datas of the Amole del Norte Channel
Table 2: Revised Hydrograph Datas of the Amole del Norte Channel
Hydrograph of the Amole del Norte Channel

Hydrograph Computational Datas

FIGURE 1 VICINITY MAP



I. INTRODUCTION

The Arenal/Unser Drainage Management Plan has evolved from the original master drainage study of the area, prepared in July 1994 and updated in July 1996. That plan defined and analyzed the storm water runoff situation for a large portion of land south of Sage Road SW between the Snow Vista Diversion Channel at the westerly boundary unit and the Amole del Norte Diversion Channel defining the easterly boundary of the study.

The previous study defined the existing drainage basins and quantified the storm water runoff characteristics for the 100-year frequency/6-hour duration storm. The storm water rates and volumes calculated in the 1996 study are used as the basis of developing the Drainage Management Plan presented in this report. The AHYMO models have been revised and expanded to reflect the proposed developable areas. The summary files and output files from these models are found in Appendix C of this report.

It is the intent of this plan to present a viable solution to the basin storm water runoff problem currently inhibiting the development potential of the area. Currently, those storm waters generated by the older Westgate Heights residential neighborhood are identified as a floodway by the latest edition of the F.E.M.A. floodway maps. The ultimate solution of providing those storm drainage facilities and eliminating the floodplain is contingent upon the joint efforts of both the public and private sectors. Their role shall be clearly delineated by the following plan.

II. PLAN SPONSORS AND PARTICIPANTS

The following passive land owner and active developers along with the City of Albuquerque are responsible for the funding and construction of the public infrastructure required for the completion of the plan.

A. **Albuquerque South:** A passive land holding general partnership owning most of the undeveloped land in the contributing drainage basins.

B. **Presley Homes, Inc.:** Developers of the Summerfield Subdivision (Sunrise Estates, Units One, Two, and Three). The initial development of Unit One (93 R-1 lots) required the construction of a 60-66" diameter storm drain to convey those storm waters generated for the Westgate Heights development immediately to the west and discharging its storm water via Sapphire Street.

The second unit of Presley's development will construct the Kimela Road and Unser Blvd. storm drains and will be 100% funded by the developer.

C. **Longford Homes of New Mexico:** The Rolling Hills Subdivision will ultimately consist of approximately 336 single family residential lots divided into five phases with the Unit Two project currently under

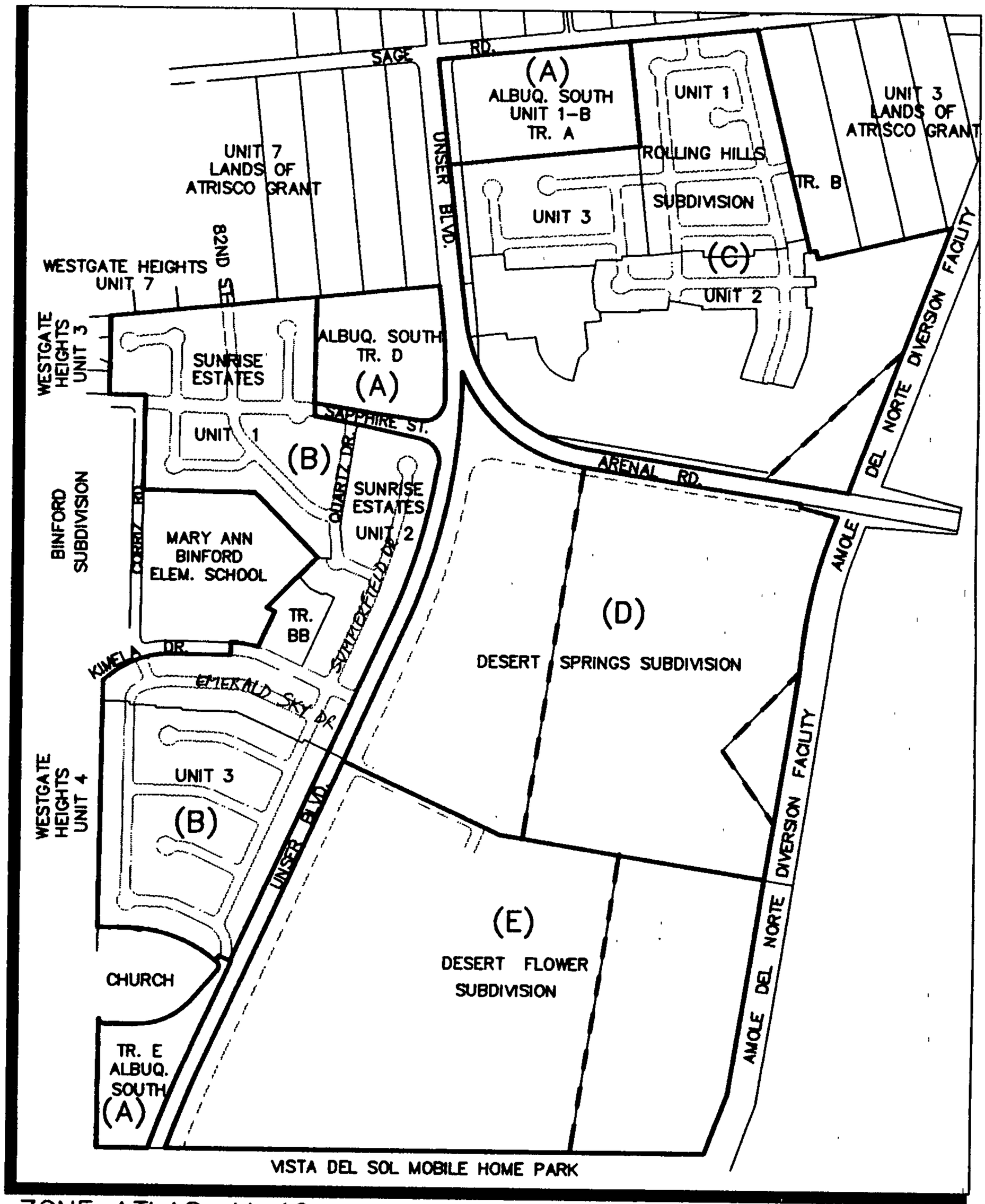
construction. The development is situated between Sage Road and Arenal Road just east of Unser Blvd. SW. Units Three and Four are at various stages in the platting process and are scheduled for construction in early 1997.

The overall development is covered by the Rolling Hills Drainage Management Plan on file at City of Albuquerque Hydrology Division. This plan proposes to discharge the developed storm waters directly to the Amole del Norte Channel at two locations. The project will construct two storm drain lines in the east-west streets and construction of all phases shall be independent of the City funded storm drain situated in Arenal Road.

D. **Builders Investment Co. of NM, Ltd.:** This developer is under contract to purchase 77 acres along the south right-of-way of Arenal Road between Unser Blvd. and the Amole del Norte Diversion Channel. The single family subdivisions (RLT zoning) is projected to be developed in four units with the first phase being a 102 lot subdivision east of Unser Blvd.

The approval and development of Unit One will require the dedication of approximately 3.8 acres at the southeast corner of Unser Blvd. and Arenal Road SW. This area will be utilized as a detention facility for the Unser/Sapphire storm drain system. The phased development

PLAN SPONSORS OWNERSHP MAP



ZONE ATLAS: M-10

SCALE: 1"=750'±

(A) ALBUQUERQUE SOUTH GENERAL PARTNERSHIP
(B) PRESLEY HOMES
(C) LONGFORD HOMES OF NEW MEXICO
(D) BUILDERS INVESTMENT COMPANY OF NEW MEXICO, LTD.
(E) CURB, INC.

9030WNMP.DWGems 06/18/97

of this first, temporary/ultimately, permanent detention pond shall be discussed further in the body of this report.

E. **Curb, Inc.:** Curb, Inc. has purchased a portion of Tract F, Albuquerque South, Unit One, consisting of 60.2 acres. A majority of Tract F is protected from upstream drainage by the proposed improvements to Unser Blvd. bordering on the west. The single family subdivision (proposed R-LT zoning) is projected to be developed in four units. The first phase will have an 84 lot subdivision and lies east of Unser Blvd.

III. PROPOSED DRAINAGE MANAGEMENT PLAN SOLUTION

The plan participants identified above have all purchased their parcels from the Albuquerque South General Partnership. The storm water runoff from each development will ultimately be accepted by the Amole del Norte Diversion Channel. The channel was designed using the older hydrology methods and is now under study by Leedshill-Herkenhoff Engineers under contract to AMAFCA to determine if and how much the channel is undersized with respect to handling the fully developed storm water runoff under current hydrology criteria.

It is the intent of this plan to demonstrate that a single regional detention facility at the southeast quadrant of Unser Blvd. and Arenal Road will provide the necessary detention of storm waters and a reduction in the storm water rate of flow into the Amole del Norte Diversion Channel to the same discharge rate the channel was originally designed by Boyle Engineering Corp (BEC) in 1985. The reduced rate shall apply to the parcels identified as the plan participants and will encompass eight to nine connection points to the channel.

The BEC report titled "Investigation Phase Report for the Re-Evaluation Study of the Amole del Norte Storm Diversion Facility" dated June 1984 was the design basis for the construction of the Amole del Norte Channel. The report was a hydrological analysis for the Amole del Norte Drainage basin using the SCS curve number method which was the accepted rationale at the time. The subbasin boundaries determined in the BEC report correspond with the boundaries used in our analysis. BEC's subbasins 32-36 and 38 were replaced with subbasins 100-505 in this report. It was determined that the best way to derive a discharge rate to the Amole del Norte Channel was to reduce the flow rate/unit area (cfs/ac) from the current analysis to that of the BEC study. The detention pond will then be designed such that it will be sufficiently large enough to detain the discharge from the upstream areas to the cfs/ac that the channel was originally designed for in 1984. The AHYMO model in Appendix C includes a reservoir route to preliminarily design the detention pond. A more complete design of the pond will be performed when construction of the pond becomes necessary for further development to proceed.

Analysis of the side discharges to the channel were needed to determine how much runoff could discharge into the channel. BEC report shows that subbasins 32-35 make a side discharge to the channel at Arenal Road, subbasin 36 makes a side discharge 1700' south of Arenal Road, and subbasin 38 makes a side discharge 3000' south of Arenal Road. Hydrographs for these side discharges into the channel are shown in Table 1 (see Appendix), taken from BEC report. New hydrographs of the subbasins above were needed to represent current developed discharges into the side of the channel. Our study derived nine new hydrographs to replace the hydrographs above. Four new side flows, side flow 980' south of Sage Road, side flow 1000' north of Arenal Road, side flow 200' north of Arenal Road, and side flow 1150' south of Arenal Road were added and are shown in Table 2 (see Appendix). The hydrographs of the side flows in Table 2 were obtained from computations with peak runoffs and times of concentration. Peak runoffs were based from AHYMO runs, combined with times of concentration using SCS Upland Method, to obtain a list of hydrograph data points. The hydrograph results are shown in Table 2. Comparison between the new and the previous hydrographs of the Amole del Norte Channel can be made by referring to Tables 1 and 2 or to the graph. Table 2 shows that the new channel hydrograph peak discharge is slightly lower than that of the previous hydrograph, roughly 1891 cfs vs. 1902 cfs. This is achieved by several factors. First, the temporary surge pond at Arenal Road and Unser Blvd. was enlarged to detain enough runoff so that discharge to the channel via Arenal Road would not exceed previous discharge calculated by BEC report. Second, storm drain pipes from the pond to the channel were sized and placed at certain elevation in the pond to

control the flow to the channel. Third, side discharges north and south of Arenal Road were computed using adjusted areas giving lower times of concentration. The times to peak averaged at 14 minutes vs. 21 minutes computed from BEC report. As a result, the factors pointed out above derive a hydrograph shown on Table 2 with a peak discharge slightly lower than the one from BEC report.

The Appendix contains tables, graph, and computational datas regarding the analysis of the discharges to the Amole del Norte Channel. Basin ID map from Boyle Engineering Corporation report is attached, followed by tables and graph of the hydrograph for the channel. Hydrograph calculations and referencing datas gathered from BEC report make up the last part of the appendix in this section.

IV. THE PLAN

A four acre regional storm water detention facility shall be the backbone of the plan solution. The interim storage of storm water volumes in excess of the downstream storm drain carrying capacity for both the proposed Arenal Road storm drain and the Amole del Norte Diversion Channel shall be analyzed to achieve a balance runoff credit for the combined developing area of the participant's developments.

A. **Existing Conditions:** Presently, 100% of the offsite storm waters being accepted by the Amole del Norte Diversion Channel is from overland flows generated from the Westgate Heights Subdivision, Presley Homes Summerfield Subdivision, Unit One, and the undeveloped property west of the Amole del Norte Channel.

The existing storm drain in Sapphire Street releases its flows to the historical overland drainage route where they are eventually accepted by the channel via a side inlet approximately 800 feet south of Arenal Road.

B. **Proposed Improvements:** The required improvements are proposed for construction in three distinct and coordinated phases as follows:

1. Presley Homes: Sunrise Estates, Unit Two has the Sapphire Street storm drain extension to Unser Blvd.; the Kimela Road storm drain from the east end of the APS property to Unser Blvd.; the Unser Blvd. storm drain from Kimela to Arenal Road; and the temporary storm water detention and surge pond at Unser Blvd. and Arenal Road as found on the Required Infrastructure Listing of the subdivision and will be financially guaranteed and constructed.

2. Longford Homes of New Mexico: The Rolling Hills Subdivision Units Two through Five are allowed to develop independently of the Arenal Road storm drain. This is due to the fact that the Rolling Hills development has two interior backbone storm drains and separate connections to the Amole del Norte Diversion Channel approved per the Rolling Hills D.M.P.

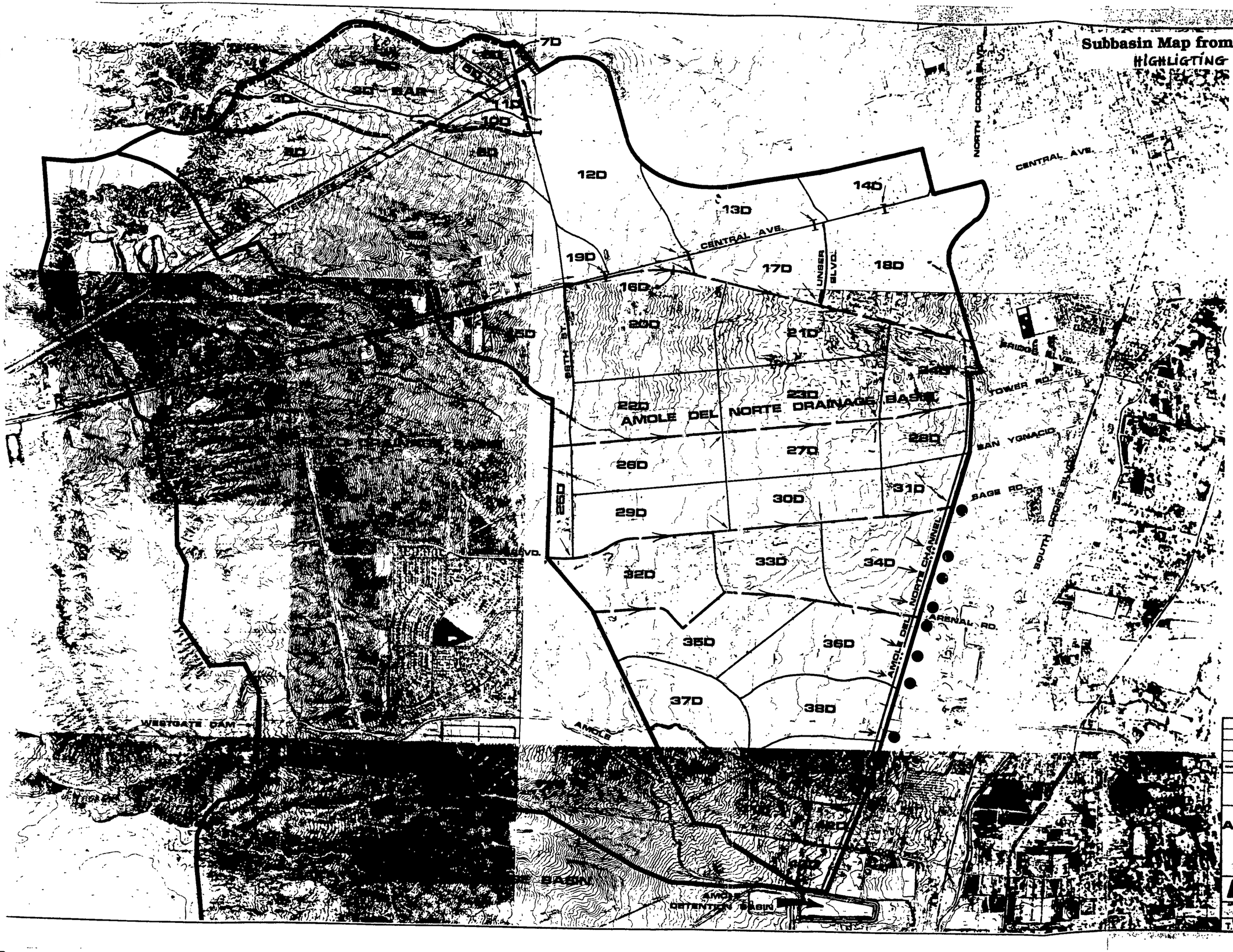
3. Builders Investment Co. of NM, Ltd.: Development of the multi-phase Desert Springs Subdivisions is dependent upon the construction of the Unser Blvd. storm drain and the interim detention pond. These improvements will allow for the development of Unit One along Unser Blvd. The subsequent Units will require the construction of the Arenal Road storm drain and modifying the temporary detention/surge pond into the permanent regional storm water detention facility.

4. City of Albuquerque: The City has designated the Arenal Road storm drain as a masterplan facility and is currently on the City's 1997 C.I.P. funding of storm drainage projects. This improvement is required for the development of those subdivisions east of Desert Springs, Unit One.

5. Curb, Inc.: The development of this 60.2 acre parcel is dependent upon the Kimela Road and Unser Blvd. storm drainage improvements. The individual subdivisions shall be covered by a master drainage plan and will be required to have internal storm drain systems to supplement the street carrying capability to convey 100% of the offsite and onsite storm waters to the Amole del Norte Diversion Channel.

APPENDIX

Subbasin Map from Boyle Engineering Report
HIGHLIGTING areas of study



N

SCALE: 1" = 1000'

1000 0 1000 2000 FEET

Drainage subbasins to be adjusted

locations of side discharges for adjusted drainage basins

LEGEND

- DRAINAGE BOUNDARY
- SUBBASIN BOUNDARY
- 24D SUBBASIN NUMBER
- EXIST. CULVERTS
- FUTURE STORM SEWER
- OUTFLOW LOCATIONS
- COMBINED SUBBASIN BOUNDARY

REVISIONS	DATE	DESCRIPTION	APPROVED

PLATE 1

AMOLE DETENTION BASIN UPLAND DRAINAGE AREAS

Boyle Engineering Corporation
consulting engineers

DESIGNED	DRAWN	CHECKED	DATE	DRAWING NO	SHEET NO
T.W.P.	J.D.M.	T.D.S.	FEB. 85		

TABLE 1

For Reference
From the Amole del Norte
Storm Diversion Facility Report
February 1995, Boyle Engineering

NOTE:

A = Runoff from the proposed Tierra Bayita storm drain.

B = Sum of flows entering the Amole Channel from Tower so. to the Amole Basin.

C = Discharge from a proposed 35 ac-ft detention basin at the north end of the Amole Channel (inflow = A)

TIME (HR)	A: DISCHARGE FROM PROPOSED TIERRA BAYITA STORM SEWER	B: SIDE FLOW AT TOWER ROAD	B: SIDE FLOW AT SAGE ROAD	B: SIDE FLOW AT ARENAL ROAD	B: SIDE FLOW 1700' SO. OF ARENAL	B: SIDE FLOW 3000' SO. OF ARENAL	B: SIDE FLOW 1100' NO. OF BLAKE	B: SIDE FLOW AT BLAKE ROAD	B: SIDE FLOW SOUTH OF BLAKE	B	A & B	C: DISCHARGE FROM PROPOSED 35 AC-FT DETENTION BASIN NO. OF TOWER ROAD	B & C
0.2	138	189	106	117	14	42	44	56	17	585	723	0	585
0.4	1323	547	210	317	75	84	135	62	33	1463	2786	210	1673
0.5	1368	600	176	280	79	65	109	47	26	1382	2750	520	1902
0.6	1178	527	142	242	63	45	83	32	18	1152	2330	690	1842
0.8	821	335	90	151	38	27	51	21	11	724	1545	735	1459
1.0	614	221	64	103	26	21	37	15	8	495	1109	780	1275
1.2	500	158	49	79	20	17	29	12	7	371	871	720	1091
1.4	411	123	39	64	17	14	24	10	5	296	707	600	896
1.6	342	102	33	53	14	11	20	8	5	246	588	525	771
1.8	290	86	28	46	12	10	17	7	4	219	500	465	675
2.0	249	73	24	40	11	9	15	6	3	181	430	380	561
2.2	215	64	21	35	9	8	13	6	3	159	374	330	489
2.4	190	57	18	31	8	7	12	5	3	141	331	280	421
2.6	168	50	16	28	8	6	10	5	2	125	293	230	355
2.8	150	45	15	25	7	6	10	4	2	114	264	200	314
3.0	136	41	14	23	6	5	9	4	2	104	240	175	279
3.2	125	38	13	21	6	5	8	4	2	97	222	155	252
3.4	115	35	12	20	5	5	8	4	2	91	206	135	226
3.6	106	32	11	19	5	4	7	3	2	83	189	120	203
3.8	98	31	11	18	5	4	7	3	2	81	179	105	186
4.0	92	29	10	17	4	4	7	3	2	76	168	95	171
4.2	87	27	10	16	4	4	6	3	1	71	158	87	158
4.4	82	26	9	15	4	4	6	3	1	68	150	82	150
4.6	78	25	9	15	4	3	6	3	1	66	144	78	144
4.8	75	24	8	14	4	3	6	3	1	63	138	75	138
5.0	71	23	8	13	4	3	5	3	1	60	131	71	131
5.2	68	22	8	13	3	3	5	2	1	57	125	68	125
5.4	66	21	7	12	3	3	5	2	1	54	120	66	120
5.6	63	20	7	12	3	3	5	2	1	53	116	63	116
5.8	60	20	7	12	3	3	5	2	1	53	113	60	113
6.0													

HYDROGRAPH PLOTTED (SEE GRAPH)

TABLE 2
NEW HYDROGRAPH FOR THE AMOLE DEL NORTE DIVERSION CHANNEL

TIME (HR)	DISCHARGE FROM PROPOSED TIERRA BAYITA STORM SEWER A	SIDE FLOW AT TOWER ROAD	SIDE FLOW AT SAGE ROAD	ADDITIONAL SIDE FLOW AT SAGE ROAD**	SIDE FLOW AT 980' S. OF SAGE ROAD**	SIDE FLOW AT 1000' N. OF ARENAL ROAD**	SIDE FLOW AT 200' N. OF ARENAL ROAD**	SIDE FLOW AT ARENAL ROAD*	SIDE FLOW 1150' S. OF ARENAL ROAD* B	SIDE FLOW 1650' S. OF ARENAL ROAD*	SIDE FLOW AT 3000' S. OF ARENAL ROAD*	SIDE FLOW 1100' N. OF BLAKE ROAD	ADDITIONAL SIDE FLOW AT 1100' N. OF BLAKE ROAD**	SIDE FLOW AT BLAKE ROAD	SIDE FLOW S. OF BLAKE ROAD	B*	A & B*	DISCHARGE FROM PROPOSED 35 AC-FT DETENTION BASIN N. OF TOWER ROAD C	B & C* HYDROGRAPH PLOTTED (SEE GRAPH)
0.2	138	189	106	29	36	110	56	45	116	104	305	44	35	56	17	1248	1386	0	1248
0.4	1323	547	210	76	2	14	1	156	46	40	183	135	34	62	33	1539	2862	210	1749
0.5	1368	600	176	76	1	3		188	24	15	91	109	16	47	26	1372	2740	520	1891
0.6	1178	527	142	66		1		188	9	8	48	83	11	32	18	1133	2311	690	1823
0.8	821	335	90	30				139	2	2	13	51	3	21	11	697	1518	735	1432
1.0	614	221	64	16				74	1	1	4	37	1	15	8	442	1056	780	1222
1.2	500	158	49	7				39			1	29		12	7	302	802	720	1022
1.4	411	123	39	3				22				24		10	5	226	637	600	826
1.6	432	102	33	2				12				20		8	5	182	524	525	707
1.8	290	86	28	1				7				17		7	4	150	440	465	615
2.0	249	73	24					3				15		6	3	124	373	380	504
2.2	215	64	21					2				13		6	3	109	324	330	439
2.4	190	57	18					1				12		5	3	96	286	280	376
2.6	168	50	16									10		5	2	83	251	230	313
2.8	150	45	15									10		4	2	76	226	200	276
3.0	136	41	14									9		4	2	70	206	175	245
3.2	125	38	13									8		4	2	65	190	155	220
3.4	115	35	12									8		4	2	61	176	135	196
3.6	106	32	11									7		3	2	55	161	120	175
3.8	98	31	11									7		3	2	54	152	105	159
4.0	92	29	10									7		3	2	51	143	95	146
4.2	87	27	10									6		3	1	47	134	87	134
4.4	82	26	9									6		3	1	45	127	82	127
4.6	78	25	9									6		3	1	44	122	78	122
4.8	75	24	8									6		3	1	42	117	75	117
5.0	71	23	8									5		3	1	40	111	71	111
5.2	68	22	8									5		2	1	38	106	68	106
5.4	66	21	7									5		2	1	36	102	66	102
5.6	63	20	7									5		2	1	35	98	63	98
5.8	60	20	7									5		2	1	35	95	60	95
6.0																			

NOTE:

A = Runoff from the proposed Tierra Bayita storm drain.

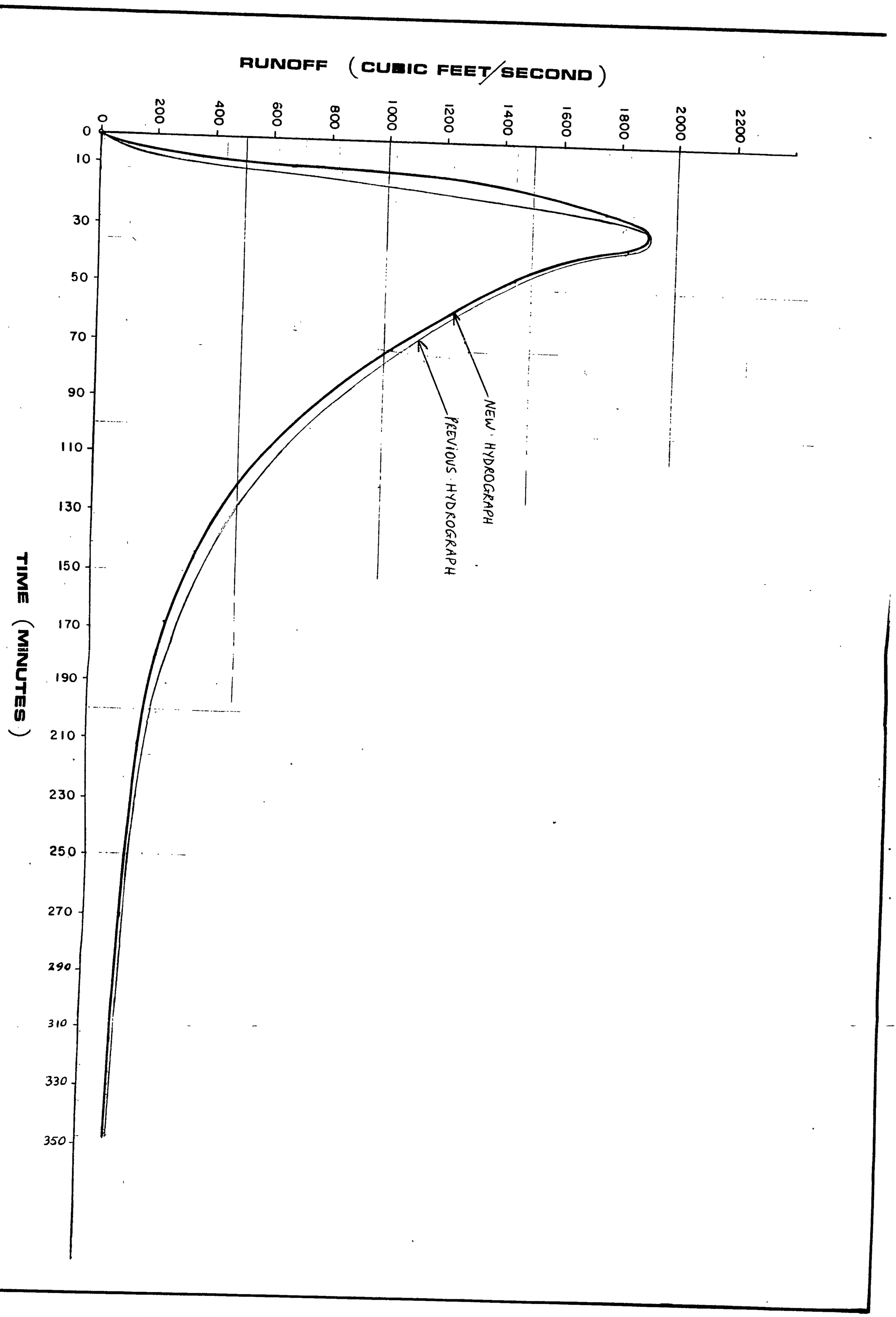
B = Sum of flows entering the Amole Channel from Tower south to the Amole Bain.

C = Discharge from a proposed 35 ac-ft detention basin at the north end of the Amole Channel (inflow = A).

*Values adjusted from Boyle Report, (see calculations section). FOR COMPARISON, SEE TABLE 1

**New side flow

903TABLE,DWGems 06/17/97



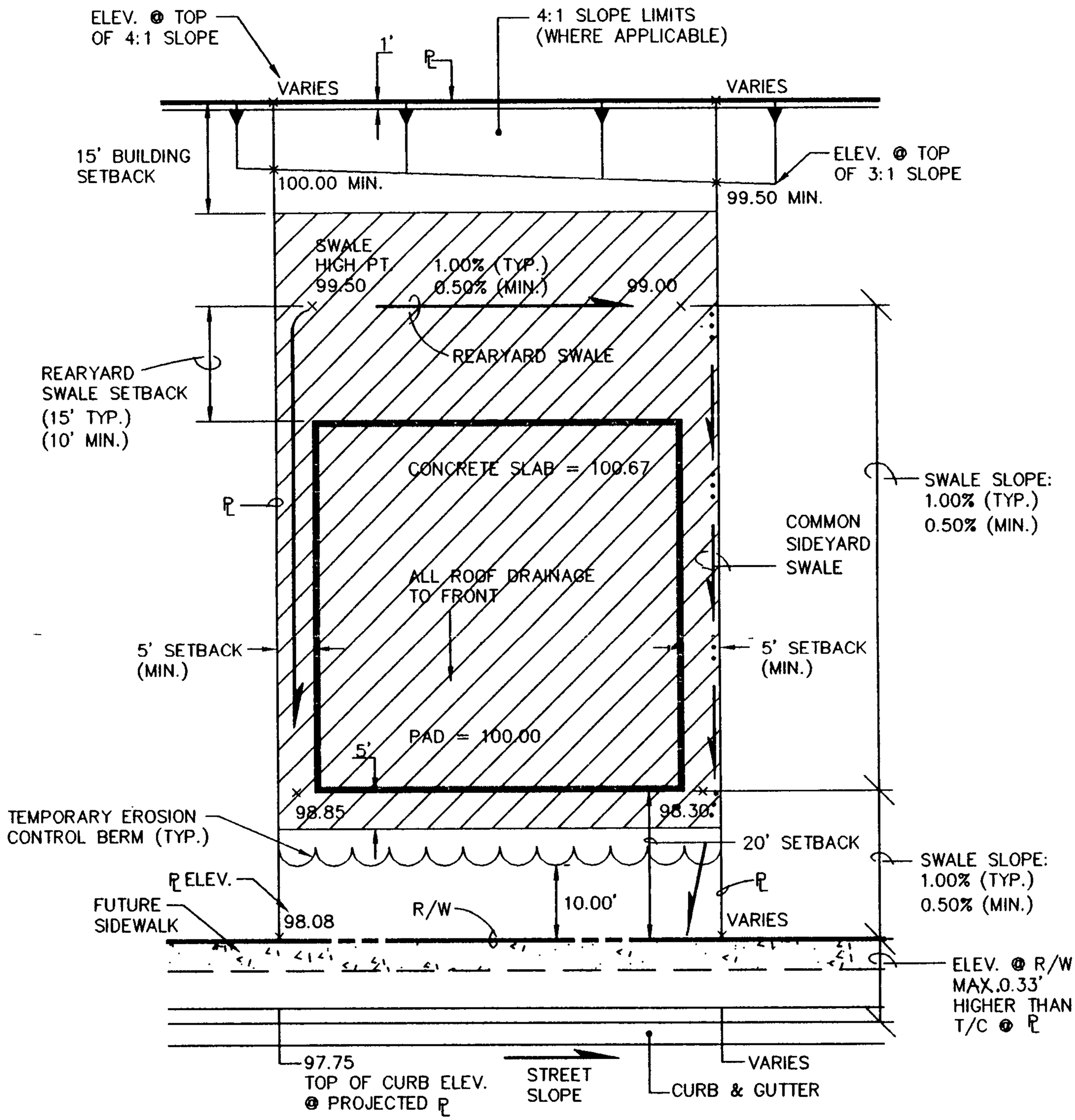
Runoff Hydrograph for the Amole del Norte Channel

HYDROGRAPH FOR BASIN 408 ⇒ 408A, 408B + 408C
(SIDE FLOW 3000' S. OF ARENAL ROAD)

BASIN LENGTH, (FT)	=	2974
DIFFERENCE IN ELEVATION ACROSS BASIN	=	56
SLOPE OF BASIN, (FT/FT)	=	.0188
AREA OF BASIN, (ACRES)	=	100.7
AREA OF BASIN, (SQ MI)	=	.15736
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (SCS UPLAND METHOD) (MIN)	=	23
TIME TO PEAK (MIN)	=	15
VOLUME OF RUNOFF (ACRE-FT) (from AHYMO run)	=	10.9
PEAK RUNOFF (CFS) (from AHYMO run)	=	327.60
RUNOFF PER ACRE (CFS/ACRE)	=	3.25

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	1.5	.030	9.83
3	.2	3.0	.100	32.76
4	.3	4.5	.190	62.24
5	.4	6.0	.310	101.56
6	.5	7.5	.470	153.97
7	.6	9.0	.660	216.22
8	.7	10.5	.820	268.63
9	.8	12.0	.930	304.67
10	.9	13.5	.990	324.32
11	1.0	15.0	1.000	327.60
12	1.1	16.5	.990	324.32
13	1.2	18.0	.930	304.67
14	1.3	19.5	.860	281.74
15	1.4	21.0	.780	255.53
16	1.5	22.5	.680	222.77
17	1.6	24.0	.560	183.46
18	1.7	25.5	.460	150.70
19	1.8	27.0	.390	127.76
20	1.9	28.5	.330	108.11
21	2.0	30.0	.280	91.73
22	2.2	33.0	.207	67.81
23	2.4	36.0	.147	48.16

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
24	2.6	39.0	.107	35.05
25	2.8	42.0	.077	25.23
26	3.0	45.0	.055	18.02
27	3.2	48.0	.040	13.10
28	3.4	51.0	.029	9.50
29	3.6	54.0	.021	6.88
30	3.8	57.0	.015	4.91
31	4.0	60.0	.011	3.60
32	4.5	67.5	.005	1.64
33	5.0	75.0	.000	.00



COMPACTION ZONE – CONTRACTOR SHALL COMPACT SOILS IN THIS AREA TO A MINIMUM OF 95% COMPACTION PER ASTM D698, FOR A DEPTH OF 12 INCHES.

TYPICAL LOT GRADING SHOWING COMPACTION ZONE

1"=20'

FIGURE 4

930FIG3.DWGems 7/24/97

ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

Albuquerque, NM

DRAINAGE INFORMATION SHEET

PROJECT TITLE: DESERT FLOWER S/D, UNIT ONE ZONE ATLAS/DRNG. FILE #: M-10/D5

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: TR. F, ALBUQUERQUE SOUTH, UNIT ONE

CITY ADDRESS: N/A

ENGINEERING FIRM: ISAACSON & ARFMAN, P.A. CONTACT: FRED C. ARFMAN

ADDRESS: 128 MONROE ST. NE PHONE: 268-8828

OWNER: CURB INC CONTACT: BO JOHNSON

ADDRESS: 6301 INDIAN SCH. RD. PHONE: 899-1656

ARCHITECT: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: ALDRICH LAND SURVEYING CONTACT: TIM ALDRICH

ADDRESS: _____ PHONE: 884-1990

CONTRACTOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

- [x] DRAINAGE REPORT
- [ ] DRAINAGE PLAN
- [ ] CONCEPTUAL GRADING & DRAINAGE PLAN
- [x] GRADING PLAN
- [ ] EROSION CONTROL PLAN
- [ ] ENGINEER'S CERTIFICATION
- [ ] OTHER

PRE-DESIGN MEETING:

- [ ] YES
- [ ] NO
- [ ] COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- [ ] SKETCH PLAT APPROVAL
- [x] PRELIMINARY PLAT APPROVAL
- [ ] S. DEV. PLAN FOR SUB'D. APPROVAL
- [ ] S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- [ ] SECTOR PLAN APPROVAL
- [ ] FINAL PLAT APPROVAL
- [ ] FOUNDATION PERMIT APPROVAL
- [ ] BUILDING PERMIT APPROVAL
- [ ] CERTIFICATE OF OCCUPANCY APPROVAL
- [ ] GRADING PERMIT APPROVAL
- [ ] PAVING PERMIT APPROVAL
- [ ] S.A.D. DRAINAGE REPORT
- [ ] DRAINAGE REQUIREMENTS
- [ ] OTHER _____ (SPECIFY)

DATE SUBMITTED: 4/25/97 Scott M McGee

BY: FOR FRED C. ARFMAN, P.E.

FOR: ISAACSON & ARFMAN, P.A.

RECEIVED
APR 25 1997
HYDROLOGY SECTION

MASTER DRAINAGE REPORT

FOR

DESERT FLOWER SUBDIVISION
UNITS ONE THROUGH FOUR

A 350 LOT (FOUR PHASE) SINGLE FAMILY RESIDENTIAL SUBDIVISION

ALBUQUERQUE NEW MEXICO
APRIL 1997

Prepared by:

ISAACSON & ARFMAN, P.A.
128 Monroe Street, NE
Albuquerque, NM 87108
(505) 268-8828

FRED C. ARFMAN STATE OF NEW MEXICO 7322 REGISTERED PROFESSIONAL ENGINEER

4-24-97

Fred C. Arfman, P.E. **Date**

RECEIVED
APR 25 1997
HYDROLOGY SECTION

TABLE OF CONTENTS

Introduction

I. Project Information
II. Site Characteristics

Conclusion & Recommendations

Summary Tables

Table 1 - Hydrologic Flow Parameters

Table 2 - Street Flow Characteristics

Table 3 - Storm Inlet Capacities

Table 4 - Storm Sewer Sump Inlet Capacities

Appendices

Appendix A: Onsite AHYMO Summary & Detailed Output
100-Year Storm
10-Year Storm

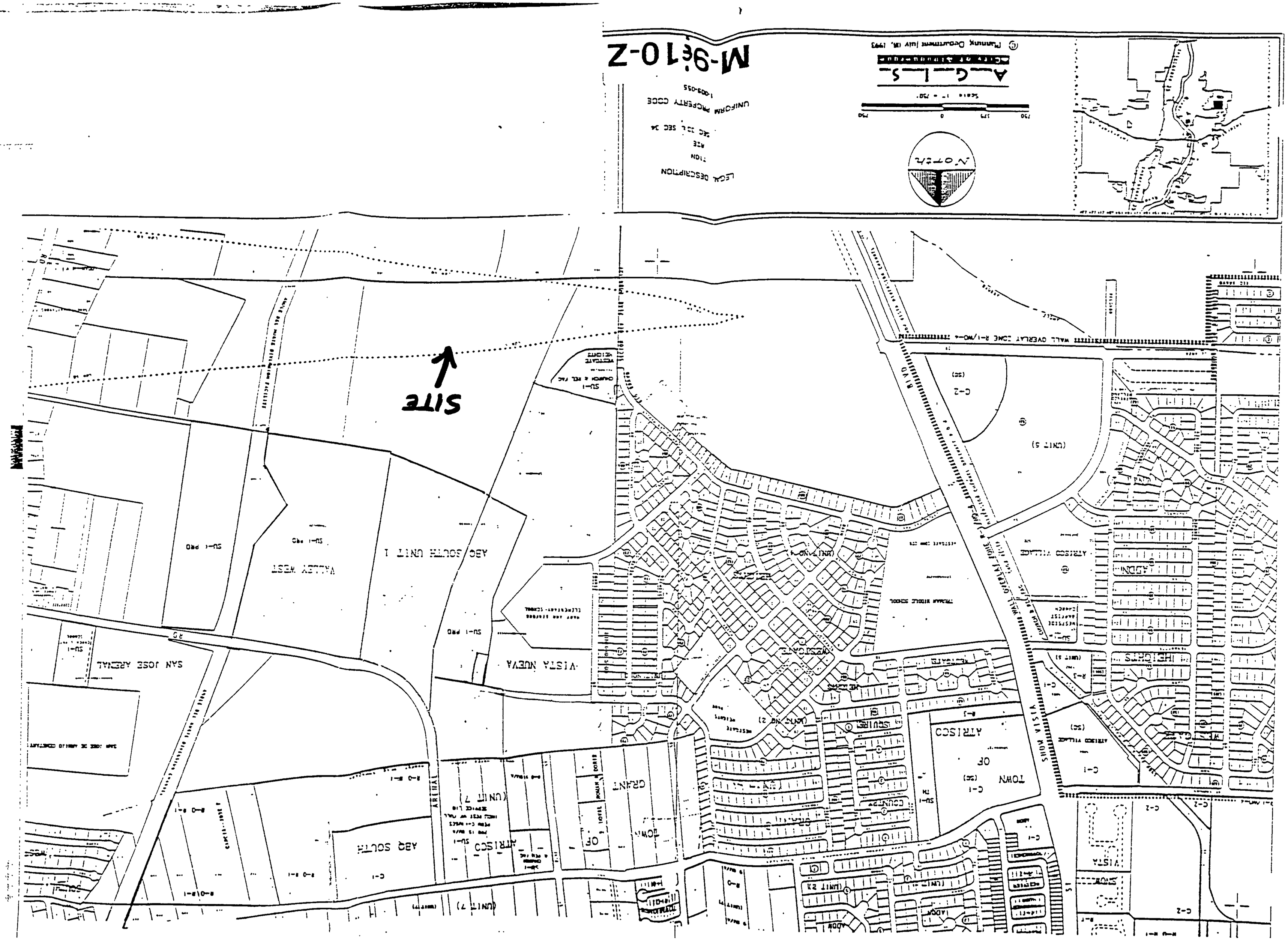
Appendix B: Offsite AHYMO Summary & Detailed Output

Pockets

Master Drainage Plan of April 1997

Offsite Drainage Plan of April 1997

Unit One Grading Plan


M-9610-Z
LEGAL DESCRIPTION
TION
RGE
SEC 32 & SEC 34
UNIFORM PROPERTY CODE
1-003-055
NORTH
Scale 1" = 200'
A-G-L-S
City of Sunnyvale
© Planning Department July 19, 1993
SITE
SAN JOSE ARENAL
VALLEY WEST
ARQ SOUTH UNIT 1
VISTA NUEVA
ARQ SOUTH
ATRISCO
TOWN OF ATRISCO
GRANT
COUNTRY
SQUIRES
WESTGATE
HEIGHTS
VISTA
VISTA ROAS
ADDN
(UNIT 5)
(UNIT 7)
(UNIT 2A)
(UNIT NO 2)
(UNIT NO 1)
C-2
C-1
R-1
SU-1
SU-1 PRO
R-0 R-1
WALL OVERLAY ZONE R-1/MO-4

INTRODUCTION

Status?

The Desert Flower Subdivision development is a masterplan community consisting of multiple phases. The development shall consist of a minimum of four phases, Units One through Four having 84, 76, 91, and 90 single family lots, respectfully. The individual subdivision (Units) of the overall development will be constructed using public utilities, paving, and storm drainage improvements according to the City of Albuquerque Development Standards and Guidelines. This study shall analyze the area wide drainage characteristics as they impact the site and offer solutions and recommendations to solve the hydrological and hydraulic conditions projected to occur in the event of the 100-year storm.

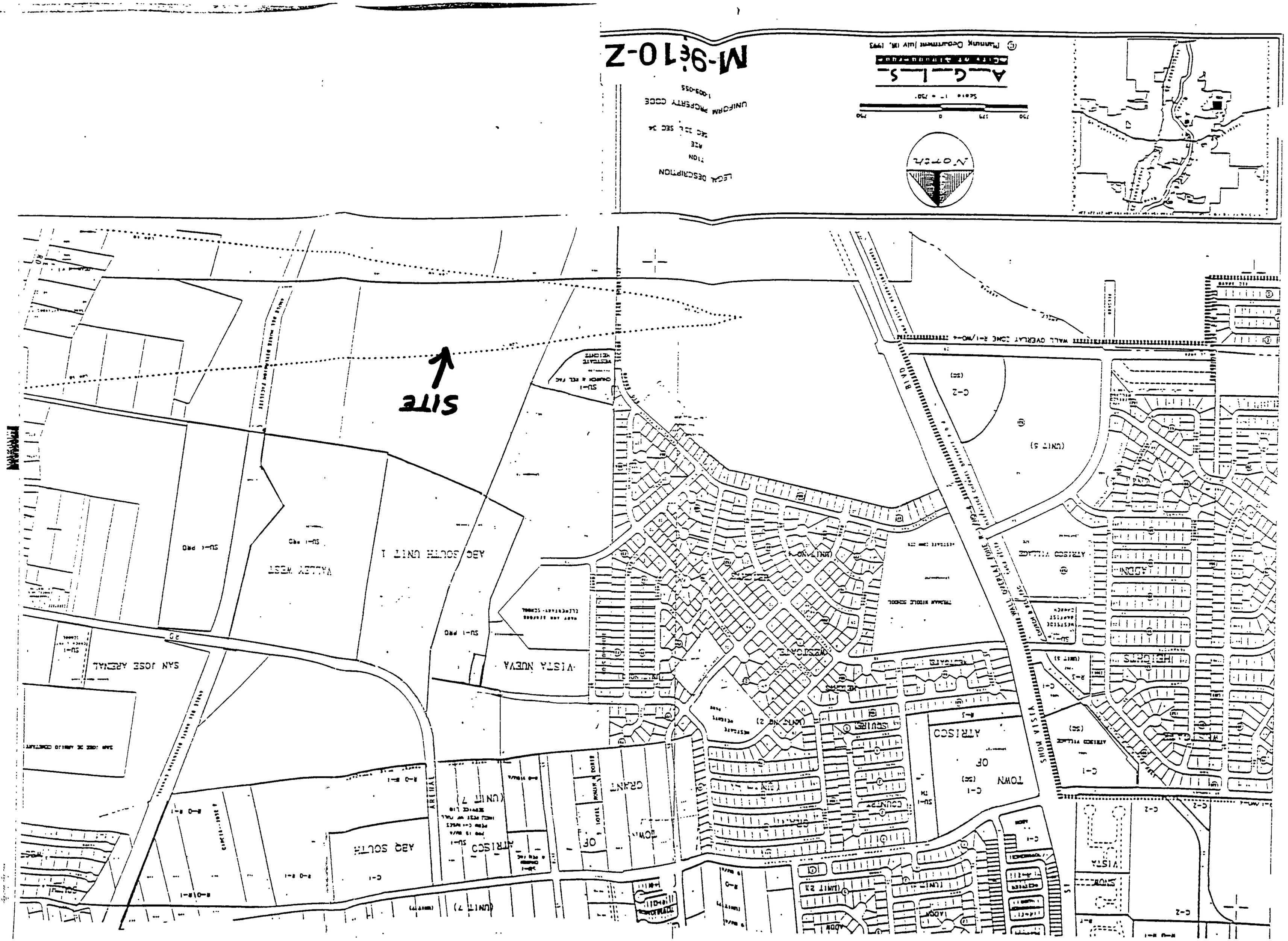
I. PROJECT INFORMATION

LEGAL DESCRIPTION: A parcel of land comprising of Tract F, Albuquerque South, Unit One (August 3, 1987, Volume C34, Folio 74).

ENGINEER: Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
Attn: Fred C. Arfman, P.E.
(505) 268-8828

SURVEYOR: Aldrich Land Surveying, Inc.
Attn: Tim Aldrich, NMPLS No. 7719
(505) 884-1990

BENCHMARK: ACS Monument "1-M10" located at the southeast quadrant of Sage Road and Unser Blvd. SW.
Elevation: 5079.88


M-96-10-Z
A-G-L-S
City of Sunnyvale
© Planning Department July 1993
Scale 1" = 750'
750 375 0 750
NORTH
LEGAL DESCRIPTION
T10N
R2E
SEC 32 & SEC 34
UNIFORM PROPERTY CODE
1-003-055
SITE
SAN JOSE ARSENAL
VALLEY WEST
ASQ SOUTH UNIT 1
VISTA NUEVA
ASQ SOUTH
ARTISCO
TOWN OF ARTISCO
GRANT
ARTISCO VILLAGE
VISTA MONTE
VISTA
HEIGHTS
ADDN
(UNIT 5)
(UNIT 7)
(UNIT 2)
(UNIT NO 2)
(UNIT NO 4)
SQUIRES
COUNTRY
WESTGATE
TRUMAN MIDDLE SCHOOL
BLVD
ARTERIAL
WALL OVERLAY ZONE R-1/MO-4
C-1
C-2
R-0
R-1
R-3
SU-1
SU-1 PRO

INTRODUCTION

Status?

The Desert Flower Subdivision development is a masterplan community consisting of multiple phases. The development shall consist of a minimum of four phases, Units One through Four having 84, 76, 91, and 90 single family lots, respectfully. The individual subdivision (Units) of the overall development will be constructed using public utilities, paving, and storm drainage improvements according to the City of Albuquerque Development Standards and Guidelines. This study shall analyze the area wide drainage characteristics as they impact the site and offer solutions and recommendations to solve the hydrological and hydraulic conditions projected to occur in the event of the 100-year storm.

I. PROJECT INFORMATION

LEGAL DESCRIPTION: A parcel of land comprising of Tract F, Albuquerque South, Unit One (August 3, 1987, Volume C34, Folio 74).

ENGINEER: Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
Attn: Fred C. Arfman, P.E.
(505) 268-8828

SURVEYOR: Aldrich Land Surveying, Inc.
Attn: Tim Aldrich, NMPLS No. 7719
(505) 884-1990

BENCHMARK: ACS Monument "1-M10" located at the southeast quadrant of Sage Road and Unser Blvd. SW.
Elevation: 5079.88

ZONING: RLT

NUMBER OF EXISTING TRACTS: 1

NUMBER OF PROPOSED LOTS:

Unit One: 84
Unit Two: 76
Unit Three: 91
Unit Four: 90

TOTAL AREA: 60.28 Ac.
2,625,797 Sq. Ft.

II. SITE CHARACTERISTICS

FLOOD HAZARD: No part of this development is affected nor contributes to a flood hazard area as determined by Panel ~~No. 350002-0033 of~~ the ~~October 14, 1983~~ Sept. 20 1996 Edition of the F.E.M.A. Maps.

EXISTING CONDITIONS: This site is currently undeveloped and mostly undisturbed with native ground cover, typical of the City's west side (Land Treatment B). The site has a slope downward toward the east at slopes ranging from 1 to 2 percent. It abuts future Desert Springs Subdivision to the north, Unser Blvd. to the west, and unplatted land to the east and south. Storm water generated from the site flows east onto unplatted land and into the side of the Amole del Norte Channel. Offsite storm waters generated from Unit Two of Sunrise Estates currently are released to Unser Blvd. and are then conveyed

free discharge?

by a combination of street flow and storm drain to an offsite detention pond. Flows are slowly released and are allowed to overland flow on to Basin 406 and 407, and entrance to the side of the Amole del Norte Diversion Channel. Runoff south of the proposed development flows southeast and does not affect the site.

PROPOSED CONDITIONS:

Unit One: This phase will be developed first with 84 lots and will not require storm drain construction. Flows from April Flower Road, Purple Cone Road, and Purple Fringe Road will enter downstream temporary surge/retention ponds at the east end of Unit One.

runoff turns 90° ?

where ? Show on plan.

Unser Blvd.: Being adjacent and to the west of this phase is included as part of the development and will be analyzed for storm water flow carrying capacity for both the 10-year and 100-year event. A dry lane must be preserved for the 10-year developed runoff.

is storm drain required ?

A storm drain extension in the future north bound lane of Unser Blvd. will be designed to accept those excess storm waters generated by the street improvements above the dry-lane street carrying capacity.

Unit Two: This phase will consist of 76 lots situated to the east of Unit One within the northeast quadrant of the site, and will require the construction of a storm drain near the east end. Retention ponds used to capture Unit One runoffs will be removed. Flows from Unit One will be allowed to enter Unit Two with the continuation of Purple Cone Road and Purple Fringe Road. The flows on these streets which comprise of the runoffs from Unit One and most of the runoffs from Unit Two will enter a battery of inlets at the sump locations near the intersection with Spring Canyon Drive. The rest of the runoff from Unit Two will flow east on April Flower Place and enter the sump inlet near the intersection with Spring Canyon Drive. The flows from all the inlets above will enter the storm drain line on Spring Canyon Drive and flow south. This line will discharge the flow into a temporary detention pond at the south end of Unit Two.

Street Cap?

where?

Unit Three: The development of the 91 lots of this phase will not require storm drain construction. Runoff at the upper end on Native Flower Place will flow onto Desert Flower Place and combine with the runoff on Desert Flower Road. This combined flow will be added to the flow coming down on Purple Rock Place and Desertwood Drive. The total flow will then enter a temporary detention pond in Unit Four.

The southerly portion of Unser Blvd. has a southerly surface drainage pattern. Street flows shall be allowed to enter into a public detention pond at the southeast quadrant of the intersection of Unser Blvd. and Desert Flower Road. Storm waters shall then be released onto Desert Flower Road via a drain pipe through the south curb face.

No - temporary? retention

Unit Four: The last phase will have 90 lots and will require the construction of a storm drain from the southwest end to the northeast end. Temporary detention ponds used to capture runoffs from Unit Two and Three will be removed and replaced with storm drain line and inlets. Two inlets will be placed on Desert Flower Road at the west end of Unit Four. These inlets will take in some of the runoff from Unit Three. The by-pass flow will travel down on Desert Flower Road, then to Cosmos Drive where some of the flow will enter the two inlets near the intersection with Saltbrush Road. The by-pass flow will combine with the flow on Saltbrush Road which make up of the discharges from Desert Spring Drive and Purple Canyon Drive. The total combined flow will enter a battery of inlets at the sump location near the east end of Unit Four. The storm drain line that carries this flow will travel east into the undeveloped tract of land and make a side discharge into the Amole del Norte Channel. easements

CONCLUSIONS & RECOMMENDATIONS

Desert Flower Units One, Two, Three, and Four are proposed to be developed consecutively. Onsite and offsite runoffs have been addressed as to how the subdivision will have a cohesive drainage solution. Tables 1 thru 4 give more in depth and summarize the fundamentals of concern. Table 1 lists the onsite basins and their discharges, table 2 shows the street capacity in details at different locations, table 3 gives inlet capacity at key points, and table 4 analyses inlets at sump locations with weir and orifice conditions. The appendices follows the Table section containing the AHYMO printouts for the 100-year and 10-year storm. Summary tables and detailed outputs are within this section. Pockets at the last part of this report contain master onsite and offsite drainage plans. The recommendations for Units One to Four construction are presented below:

Retention ? Detention pond is required at the downstream end of a unit where runoffs will be discharged onto future unit..

- Detention pond is to be removed and replaced with storm drain system or appropriate rundown when abutting unit is in place.
- Berms or swale points shall be graded around the developing unit so that offsite runoff will not affect this unit.
- Units One and Three lots running parallel to Unser Blvd. shall be graded to match Unser Blvd. future grades.
- The entire reach of the storm drain from Unit Four to the Amole del Norte Channel should be constructed as part of the Unit Four improvements and should fall within the approved easement. Bonded w/ Unit 1

?

- Developer should have the option of constructing the hard lined connection between the storm drain outfall to the Amole del Norte Diversion Channel as temporary, permanent or a combination of both.
- No rear yard ponding shall be allowed in this portion of the development (see Typical Lot Grading Detail).
- Adjacent lots may share a common lot line drainage swale (see Typical Lot Grading Detail).

SUMMARY TABLES

TABLE 1
ONSITE & OFFSITE BASIN SUMMARY

Basin ID	Area (Sq. Mi.)	Contributing Basins	Cummulative Area (Sq. Mi.)	% A	% B	% C	% D	Basin Q (cfs)	Cummulative Q (cfs)
100	0.00608	100	0.00608	0	29	29	42	12.7	12.7
101	0.00432	100,101	0.0104	0	29	29	42	9.0	21.7
102	0.00728	101*,102	0.01768	0	29	29	42	15.2	36.9
103	0.00953	102*,103	0.02721	0	29	29	42	19.8	56.7
104	0.00470	103*,104	0.03191	0	29	29	42	9.8	66.5
105	0.00503	104*,105	0.03694	0	29	29	42	10.5	77.0
106	0.00390	105*,106	0.04084	0	29	29	42	8.1	85.1
107	0.00623	106*,107	0.04707	0	29	29	42	13.0	98.1
108	0.00738	108	0.00738	0	29	29	42	15.4	15.4
109	0.00672	108,109	0.0141	0	29	29	42	14.0	29.4
110	0.00844	109*,110	0.02254	0	29	29	42	17.6	47.0
111	0.00315	110*,111	0.02569	33	19	19	29	5.2	52.2
112	0.00292	111*,112	0.02861	0	29	29	42	6.1	58.3
113	0.00627	112*,113	0.03488	0	29	29	42	13.0	71.3
114	0.00737	107*,113*,114	0.08932	0	29	29	42	15.3	184.7

*Cumulative Q of basin

TABLE 2
FLOW CHARACTERISTICS AT KEY LOCATIONS

	STREET	LOCATION (STA)	ST. WIDTH & CURB TYPE	% SLOPE	Q100 (cfs)	Dn	Dc	Vn	Vc	AREA	TOP WIDTH	EG	F	*POOL DEPT
Unit 1	April Flower Road	@ Spring Dr. Int.	28′ Mount	1.5	15.4	0.33	0.37	3.19	2.60	4.83	29.25	0.49	1.38	0.50
Unit 1	Purple Cone Road	@ Spring Dr. Int.	28′ Mount	2.5	14.0	0.30	0.36	3.62	2.52	3.87	28.96	0.50	1.74	0.48
Unit 1	Purple Fringe Road	@ Spring Dr. Int.	32′ Mount	2.8	17.6	0.32	0.39	3.97	2.60	4.43	31.01	0.56	1.91	0.52
Unit 1	Spring Drive	@ Flax Rd. Int.	32′ Stand	1.5	16.0	0.40	0.43	3.15	2.57	5.07	31.38	0.55	1.40	0.56
Unit 2	April Flower Place	@ Spring Canyon Dr. Int.	28′ Mount	1.8	11.3	0.31	0.35	3.14	2.44	4.04	29.02	0.46	1.48	0.47
Unit 2	Purple Cone Road	@ Spring Dr. Int.	28′ Stand	1.4	29.4	0.47	0.54	4.09	3.25	7.19	28.24	0.73	1.43	0.75
Unit 2	Purple Cone Road	@ Lots 8 and 13	28′ Stand	1.4	35.9	0.51	0.59	4.42	3.44	8.12	28.26	0.81	1.45	0.82
Unit 2	Purple Cone Road	@ Spring Canyon Dr. Int.	28′ Stand	1.4	42.4	0.54	0.63	4.72	3.67	8.98	28.27	0.88	1.48	0.89
Unit 2	Purple Fringe Road	@ Spring Dr. Int.	32′ Stand	1.6	32.9	0.48	0.56	4.23	3.23	7.77	32.24	0.76	1.52	0.76
	Desert Flower Pl.	@ Desert Flower Rd. Int.	28′ Stand	0.6	12.7	0.40	0.40	2.44	2.27	5.20	28.20	0.50	1.00	0.50
	Desert Flower Road	@ Purple Rock Pl. Int.	32′ Stand	1.8	21.7	0.42	0.48	3.72	2.80	5.83	32.21	0.64	1.54	0.63
	Desert Flower Road	@ West Desert-wood Dr. Int.	32′ Stand	1.8	36.9	0.49	0.58	4.59	3.33	8.04	32.25	0.82	1.62	0.80

TABLE 2 (CONTINUED)
FLOW CHARACTERISTICS AT KEY LOCATIONS

	STREET	LOCATION (STA)	ST. WIDTH & CURB TYPE	% SLOPE	Q100 (cfs)	Dn	Dc	Vn	Vc	AREA	TOP WIDTH	EG	F	*POOL DEPT
Unit 3	Desert Flower Road	@ East Desert-wood Dr. Int.	32′ Stand	1.8	54.7	0.56	0.68	5.35	3.82	10.21	32.28	1.00	1.68	0.96
Unit 3	Purple Rock Place	@ Desert Flower Rd. Int.	28′ Stand	0.7	15.2	0.42	0.42	2.63	2.55	5.77	28.21	0.53	1.03	0.55
Unit 3	Desertwood Drive	@ Lots 11 & 16	28′ Mount	0.8	10.0	0.32	0.32	2.26	2.23	4.42	29.14	0.40	1.02	0.42
Unit 3	Desertwood Drive	@ Desert Flower Rd. Int.	28′ Stand	0.8	19.8	0.46	0.47	2.95	2.84	6.71	28.23	0.59	1.07	0.63
Unit 4	Saltbrush Road	@ West Purple Canyon Dr. Int.	28′ Mount	1.8	10.5	0.29	0.32	2.97	2.29	3.54	27.67	0.42	1.49	0.42
Unit 4	Saltbrush Road	@ East Purple Canyon Dr. Int.	28′ Stand	1.8	18.6	0.40	0.45	3.68	2.79	5.05	28.20	0.61	1.53	0.60
Unit 4	Desert Flower Road	@ East Purple Cayon Dr. Int.	28′ Stand	1.84	44.5	0.52	0.64	5.23	3.73	8.51	28.26	0.94	1.68	0.91
Unit 4	Cosmos Drive	@ Salt-brush Rd. Int.	28′ Stand	1.0	54.3	0.63	0.70	4.73	3.97	11.79	28.32	0.97	1.31	1.01
Unit 4	Saltbrush Road	@ East Cosmos Dr. Int.	28′ Stand	1.8	50.5	0.54	0.67	5.37	3.83	9.03	28.27	0.99	1.68	0.95

*POOL DEPTH = Dc + (1.25Vc^2)/(2g)

TABLE 3
INLETS CAPACITY AT KEY LOCATIONS

INLET NO.	INLET TYPE	STREET	LOCATION (STA)	ST. WIDTH & CURB TYPE	% SLOPE	Q100	Dn (ft)	Qintercepted (cfs)	Qby-pass (cfs)
6 & 7	C	Desert Flower Road	@ Desertwood Dr. Int.	32' Stand	1.84	56.7	0.56	22	34.7
8 & 9	C	Cosmos Drive	@ Saltbrush Rd. Int.	28' Stand	1.0	54.3	0.63	20.4	33.9

TABLE 4
SUMMARY OF STORM SEWER SUMP INLET CAPACITIES

INLET NO.	INLET TYPE (*)	STREET	LOCATION (STA)	Q100 (cfs)	Hweir (ft)	Weir Length (ft)	Qweir (cfs)	Qweir w/ Clogging Factor (cfs)	Horifice (ft)	Area (sq.ft.)	Qorifice (cfs)	Qorifice w/Clogging Factor (cfs)
1	2	April Flower Place	@ Spring Canyon Dr.	11.3	0.87	13.75	23.3	20.97	1	8.2	42.78	25.67
2 & 3	2	Purple Cone Road	@ Spring Canyon Dr.	42.4	0.87	27.5	46.6	41.94	1	16.4	85.55	51.33
4 & 5	2	Purple Fringe Road	@ Spring Canyon Dr.	32.9	0.87	27.5	46.6	41.94	1	16.4	85.55	51.33
10 & 11	2	Saltbrush Road	@ Cosmos Drive	50.5	0.87	27.5	46.6	41.94	1	16.4	85.55	51.33

Qweir = CLH^1.5 clog factor = 0.9
Qorifice = CA (2gH)^.5 clog factor = 0.6

*1 Double Grate Type "A" Inlet (COA)
2 Double Grate Type "C" Inlet (COA)

APPENDIX A

ONSITE AHYMO SUMMARY & DETAILED OUTPUT

100-YEAR STORM

10-YEAR STORM

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AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994          RUN DATE (MON/DAY/YR) =04/21/1997
INPUT FILE = DESRT100.DAT                                                                  USER NO.= ISCARFNM.I01

                            FROM  TO                    PEAK        RUNOFF                TIME TO    CFS      PAGE =   1
                HYDROGRAPH   ID   ID        AREA     DISCHARGE     VOLUME      RUNOFF      PEAK     PER
COMMAND       IDENTIFICATION  NO.  NO.     (SQ MI)     (CFS)       (AC-FT)    (INCHES)   (HOURS)   ACRE      NOTATION

*S                 DESERT FLOWER SUBDIVISION - 100 YR POST DEVELOPMENT
*S                 DESRT100.DAT
*S                 BY: JASON NGUYEN
START                                                                                                   TIME=       .00
RAINFALL  TYPE= 1                                                                                       RAIN6=     2.200
*S BASIN 100: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       100.00   -    1        .00608        12.66        .421      1.29860    1.500    3.253 PER IMP=  42.00
*S BASIN 101: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       101.00   -    2        .00432         9.00        .299      1.29860    1.500    3.255 PER IMP=  42.00
*S COMBINE BASINS 100 AND 101 TOGETHER
ADD HYD              101.10  1& 2   3        .01040        21.66        .720      1.29854    1.500    3.254
*S BASIN 102: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       102.00   -    4        .00728        15.16        .504      1.29860    1.500    3.252 PER IMP=  42.00
*S COMBINE BASIN 102 TO HYDROGRAPH NO 101.1
ADD HYD              102.10  3& 4   5        .01769        36.82       1.225      1.29855    1.500    3.253
*S BASIN 103: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       103.00   -    6        .00953        19.83        .660      1.29860    1.500    3.251 PER IMP=  42.00
*S COMBINE BASINS 103 AND HYDROGRAPH NO. 102.1 TOGETHER
ADD HYD              103.10  5& 6   7        .02722        56.65       1.885      1.29855    1.500    3.252
*S BASIN 104: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       140.00   -    8        .00470         9.79        .325      1.29860    1.500    3.254 PER IMP=  42.00
*S COMBINE BASIN 104 AND HYDROGRAPH 103.1 TOGETHER
ADD HYD              104.10  7& 8   9        .03191        66.44       2.210      1.29855    1.500    3.253
*S BASIN 105: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       105.00   -   10        .00503        10.47        .348      1.29860    1.500    3.254 PER IMP=  42.00
*S BASIN 106: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       106.10   -   11        .00390         8.13        .270      1.29860    1.500    3.255 PER IMP=  42.00
*S COMBINE BASINS 106 AND 105 TOGETHER
ADD HYD              106.10 10&11  12        .00893        18.60        .618      1.29853    1.500    3.254
*S BASIN 107: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       107.00   -   13        .00623        12.98        .432      1.29860    1.500    3.253 PER IMP=  42.00
*S COMBINE BASIN 107 AND HYDROGRAPH NO 104.1 TOGETHER
ADD HYD              107.10 13& 9  14        .03815        79.42       2.642      1.29855    1.500    3.253
*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER
ADD HYD              107.20 12&14  15        .04708        98.01       3.260      1.29855    1.500    3.253
*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER
ADD HYD              107.20 12&14  15        .04708        98.01       3.260      1.29855    1.500    3.253
*S BASIN 108: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       108.00   -   16        .00738        15.37        .511      1.29860    1.500    3.252 PER IMP=  42.00
*S BASIN 109: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       109.00   -   17        .00672        13.99        .465      1.29860    1.500    3.252 PER IMP=  42.00
*S COMBINE BASINS 108 AND 109 TOGETHER
ADD HYD              109.10 16&17  18        .01410        29.36        .977      1.29855    1.500    3.252
*S BASIN 110: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       110.00   -   19        .00844        17.56        .584      1.29860    1.500    3.252 PER IMP=  42.00
*S BASIN 111: PARK
COMPUTE NM HYD       111.00   -   20        .00315         5.20        .169      1.00753    1.500    2.579 PER IMP=  29.00
*S BASIN 112: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       112.00   -    1        .00292         6.08        .202      1.29860    1.500    3.257 PER IMP=  42.00
*S COMBINE BASINS 111 AND 112 TOGETHER
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	112.10	20& 1	2	.00606	11.27	.371	1.14736	1.500	2.905	
*S BASIN 113: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	113.00	-	3	.00627	13.04	.434	1.29860	1.500	3.253	PER IMP= 42.00
*S COMBINE BASINS 113 AND 118 TOGETHER										
ADD HYD	113.10	3&18	4	.02037	42.40	1.411	1.29855	1.500	3.252	
*S COMBINE BASINS 113 AND 118 TOGETHER										
ADD HYD	113.20	3&18	5	.02037	42.40	1.411	1.29855	1.500	3.252	
*S BASIN 114: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	114.00	-	6	.00737	15.34	.510	1.29860	1.500	3.252	PER IMP= 42.00
*S COMBINE BASINS 110 AND 114 TOGETHER										
ADD HYD	114.10	19& 6	7	.01581	32.90	1.095	1.29856	1.500	3.252	
*S COMBINE HYDROGRAPH NO 113.2 AND 114.1 TOGETHER										
ADD HYD	114.20	5& 7	8	.03617	75.29	2.505	1.29856	1.500	3.252	
*S COMBINE HYDROGRAPH NO 107.2 AND 114.2 TOGETHER										
ADD HYD	114.30	15& 8	9	.08325	173.31	5.766	1.29855	1.500	3.253	
*S BASIN 120.1: UNSER BLVD. (OFFSITE)										
COMPUTE NM HYD	120.10	-	10	.00110	2.95	.108	1.85050	1.500	4.199	PER IMP= 90.00
*S BASIN 120.2: UNSER BLVD. (OFFSITE)										
COMPUTE NM HYD	120.20	-	11	.00459	12.29	.453	1.85050	1.500	4.182	PER IMP= 90.00
FINISH										

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AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 04/22/1997
     START TIME (HR:MIN:SEC) = 08:13:44     USER NO.= ISCARFNM.I01
     INPUT FILE = desrt100.dat

*S                DESERT FLOWER SUBDIVISION - 100 YR POST DEVELOPMENT
*S                DESRT100.DAT
*S                BY: JASON NGUYEN
*
START             RAINFALL BEGINS AT 0.0 HRS
RAINFALL          TYPE=1 RAIN QUARTER=0 RAIN ONE=1.87
                  RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333HR

            COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
            DT =     .033330 HOURS        END TIME =     5.999400 HOURS
               .0000   .0016   .0033   .0050   .0067   .0085   .0103
               .0122   .0141   .0160   .0180   .0201   .0222   .0243
               .0266   .0289   .0312   .0337   .0362   .0388   .0415
               .0443   .0472   .0502   .0534   .0567   .0601   .0637
               .0675   .0715   .0758   .0809   .0865   .0924   .1050
               .1334   .1771   .2398   .3254   .4379   .5814   .7600
               .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
              1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
              1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
              1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
              1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
              2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
              2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
              2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
              2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
              2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
              2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  2.1159
              2.1176  2.1193  2.1210  2.1227  2.1244  2.1260  2.1276
              2.1292  2.1308  2.1324  2.1340  2.1355  2.1371  2.1386
              2.1401  2.1416  2.1431  2.1446  2.1460  2.1475  2.1489
              2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
              2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
              2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
              2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
              2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
              2.1944  2.1956  2.1967  2.1978  2.1989  2.2000

*S BASIN 100: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=1 HYD NO=100.00 AREA=0.00608 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.082    CFS   UNIT VOLUME =    .9982        B =   526.28       P60 = 1.8700
    AREA =       .002554 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330
```

```
    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    9.3826    CFS   UNIT VOLUME =    .9991       B =   354.67      P60 = 1.8700
    AREA =       .003526 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1   CODE=1

                                   PARTIAL HYDROGRAPH   100.00


    RUNOFF VOLUME =     1.29860 INCHES     =        .4211 ACRE-FEET
    PEAK DISCHARGE RATE =      12.66 CFS  AT   1.500 HOURS   BASIN AREA =   .0061 SQ. MI.


*S BASIN 101: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=2 HYD NO=101.00 AREA=0.004321 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    7.1650    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
    AREA =       .001815 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    6.6681    CFS   UNIT VOLUME =    .9984       B =   354.67      P60 = 1.8700
    AREA =       .002506 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=2   CODE=1

                                   PARTIAL HYDROGRAPH   101.00


    RUNOFF VOLUME =     1.29860 INCHES     =        .2993 ACRE-FEET
    PEAK DISCHARGE RATE =       9.00 CFS  AT   1.500 HOURS   BASIN AREA =   .0043 SQ. MI.


*S COMBINE BASINS 100 AND 101 TOGETHER
ADD HYD              ID=3  HYD NO=101.1  ID=1  ID=2
PRINT HYD            ID=3  CODE=1

                                   PARTIAL HYDROGRAPH   101.10


    RUNOFF VOLUME =     1.29854 INCHES     =        .7203 ACRE-FEET
    PEAK DISCHARGE RATE =      21.66 CFS  AT   1.500 HOURS   BASIN AREA =   .0104 SQ. MI.
```

```
*S BASIN 102: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=4 HYD NO=102.00 AREA=0.007284 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   12.078    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .003059 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   11.241    CFS   UNIT VOLUME =    .9993       B =   354.67      P60 = 1.8700
    AREA =      .004225 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=4   CODE=1

                                   PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =     1.29860 INCHES     =        .5045 ACRE-FEET
    PEAK DISCHARGE RATE =      15.16 CFS  AT   1.500 HOURS   BASIN AREA =   .0073 SQ. MI.


*S COMBINE BASIN 102 TO HYDROGRAPH NO 101.1
ADD HYD              ID=5  HYD NO=102.1  ID=3  ID=4
PRINT HYD            ID=5  CODE=1

                                   PARTIAL HYDROGRAPH   102.10


    RUNOFF VOLUME =     1.29855 INCHES     =       1.2248 ACRE-FEET
    PEAK DISCHARGE RATE =      36.82 CFS  AT   1.500 HOURS   BASIN AREA =   .0177 SQ. MI.


*S BASIN 103: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=6 HYD NO=103.00 AREA=0.00953 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   15.802    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 = 1.8700
    AREA =      .004003 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   14.707    CFS   UNIT VOLUME =    .9995       B =   354.67      P60 = 1.8700
    AREA =      .005527 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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```
PRINT HYD            ID=6   CODE=1

                                   PARTIAL HYDROGRAPH   103.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .6600 ACRE-FEET
    PEAK DISCHARGE RATE =       19.83 CFS  AT   1.500 HOURS   BASIN AREA =   .0095 SQ. MI.


*S COMBINE BASINS 103 AND HYDROGRAPH NO. 102.1 TOGETHER
ADD HYD              ID=7  HYD NO=103.1 ID=5  ID=6
PRINT HYD            ID=7  CODE=1

                                   PARTIAL HYDROGRAPH   103.10

    RUNOFF VOLUME =      1.29855 INCHES      =        1.8848 ACRE-FEET
    PEAK DISCHARGE RATE =       56.65 CFS  AT   1.500 HOURS   BASIN AREA =   .0272 SQ. MI.


*S BASIN 104: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=8 HYD NO=140.00 AREA=0.004699 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.7918    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
    AREA =      .001974 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   7.2515    CFS   UNIT VOLUME =    .9986       B =   354.67      P60 = 1.8700
    AREA =      .002725 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=8   CODE=1

                                   PARTIAL HYDROGRAPH   104.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .3254 ACRE-FEET
    PEAK DISCHARGE RATE =        9.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0047 SQ. MI.


*S COMBINE BASIN 104 AND HYDROGRAPH 103.1 TOGETHER
ADD HYD              ID=9  HYD NO=104.1  ID=7  ID=8
PRINT HYD            ID=9  CODE=1
```

```
                                PARTIAL HYDROGRAPH   104.10

    RUNOFF VOLUME =     1.29855 INCHES     =       2.2102 ACRE-FEET
    PEAK DISCHARGE RATE =      66.44 CFS  AT   1.500 HOURS   BASIN AREA =   .0319 SQ. MI.


*S BASIN 105: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=10  HYD NO=105.00 AREA=0.00503 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   8.3407    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.8700
    AREA =      .002113 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   7.7623    CFS   UNIT VOLUME =    .9988       B =   354.67      P60 = 1.8700
    AREA =      .002917 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=10  CODE=1

                                PARTIAL HYDROGRAPH   105.00

    RUNOFF VOLUME =     1.29860 INCHES     =        .3484 ACRE-FEET
    PEAK DISCHARGE RATE =      10.47 CFS  AT   1.500 HOURS   BASIN AREA =   .0050 SQ. MI.


*S BASIN 106: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=11  HYD NO=106.10 AREA=0.0039 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.4669    CFS   UNIT VOLUME =    .9976       B =   526.28      P60 = 1.8700
    AREA =      .001638 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   6.0185    CFS   UNIT VOLUME =    .9982       B =   354.67      P60 = 1.8700
    AREA =      .002262 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=11   CODE=1

                                PARTIAL HYDROGRAPH   106.10
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```
    RUNOFF VOLUME =      1.29860 INCHES      =          .2701 ACRE-FEET
    PEAK DISCHARGE RATE =        8.13 CFS  AT    1.500 HOURS   BASIN AREA =   .0039 SQ. MI.


*S COMBINE BASINS 106 AND 105 TOGETHER
ADD HYD              ID=12  HYD NO=106.1  ID=10  ID=11
PRINT HYD            ID=12  CODE=1

                                PARTIAL HYDROGRAPH   106.10


    RUNOFF VOLUME =      1.29853 INCHES      =          .6184 ACRE-FEET
    PEAK DISCHARGE RATE =       18.60 CFS  AT    1.500 HOURS   BASIN AREA =   .0089 SQ. MI.


*S BASIN 107: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=13  HYD NO=107.0  AREA=0.006234 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    10.337    CFS   UNIT VOLUME =     .9982        B =   526.28      P60 = 1.8700
    AREA =       .002618 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    9.6203    CFS   UNIT VOLUME =     .9991        B =   354.67      P60 = 1.8700
    AREA =       .003616 SQ MI    IA =     .42500 INCHES    INF =    1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=13  CODE=1

                                PARTIAL HYDROGRAPH   107.00


    RUNOFF VOLUME =      1.29860 INCHES      =          .4318 ACRE-FEET
    PEAK DISCHARGE RATE =       12.98 CFS  AT    1.500 HOURS   BASIN AREA =   .0062 SQ. MI.


*S COMBINE BASIN 107 AND HYDROGRAPH NO 104.1 TOGETHER
ADD HYD              ID=14  HYD NO=107.1  ID=13  ID=9
PRINT HYD            ID=14  CODE=1

                                PARTIAL HYDROGRAPH   107.10


    RUNOFF VOLUME =      1.29855 INCHES      =         2.6420 ACRE-FEET
    PEAK DISCHARGE RATE =       79.42 CFS  AT    1.500 HOURS   BASIN AREA =   .0381 SQ. MI.
```

```
*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER
ADD HYD              ID=15  HYD NO=107.2  ID=12  ID=14
PRINT HYD            ID=15  CODE=1

                                PARTIAL HYDROGRAPH   107.20

    RUNOFF VOLUME =     1.29855 INCHES     =       3.2604 ACRE-FEET
    PEAK DISCHARGE RATE =      98.01 CFS  AT   1.500 HOURS   BASIN AREA =   .0471 SQ. MI.


*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER
ADD HYD              ID=15  HYD NO=107.2  ID=12  ID=14
PRINT HYD            ID=15  CODE=1

                                PARTIAL HYDROGRAPH   107.20

    RUNOFF VOLUME =     1.29855 INCHES     =       3.2604 ACRE-FEET
    PEAK DISCHARGE RATE =      98.01 CFS  AT   1.500 HOURS   BASIN AREA =   .0471 SQ. MI.


*S BASIN 108: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=16  HYD NO=108.0  AREA=0.007383 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   12.242    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .003101 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   11.393    CFS   UNIT VOLUME =    .9993       B =   354.67      P60 = 1.8700
    AREA =      .004282 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=16  CODE=1

                                PARTIAL HYDROGRAPH   108.00

    RUNOFF VOLUME =     1.29860 INCHES     =        .5113 ACRE-FEET
    PEAK DISCHARGE RATE =      15.37 CFS  AT   1.500 HOURS   BASIN AREA =   .0074 SQ. MI.


*S BASIN 109: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=17  HYD NO=109.0  AREA=0.00672 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1
```

```
    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   11.143    CFS   UNIT VOLUME =     .9984       B =   526.28      P60 = 1.8700
    AREA =       .002822 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   10.370    CFS   UNIT VOLUME =     .9992       B =   354.67      P60 = 1.8700
    AREA =       .003898 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=17  CODE=1

                                PARTIAL HYDROGRAPH   109.00


    RUNOFF VOLUME =     1.29860 INCHES     =         .4654 ACRE-FEET
    PEAK DISCHARGE RATE =      13.99 CFS  AT   1.500 HOURS   BASIN AREA =   .0067 SQ. MI.


*S COMBINE BASINS 108 AND 109 TOGETHER
ADD HYD             ID=18  HYD NO=109.1  ID=16  ID=17
PRINT HYD           ID=18  CODE=1

                                PARTIAL HYDROGRAPH   109.10


    RUNOFF VOLUME =     1.29855 INCHES     =         .9767 ACRE-FEET
    PEAK DISCHARGE RATE =      29.36 CFS  AT   1.500 HOURS   BASIN AREA =   .0141 SQ. MI.


*S BASIN 110: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=19  HYD NO=110.0  AREA=0.008436 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   13.988    CFS   UNIT VOLUME =     .9985       B =   526.28      P60 = 1.8700
    AREA =       .003543 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   13.018    CFS   UNIT VOLUME =     .9994       B =   354.67      P60 = 1.8700
    AREA =       .004893 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=19  CODE=1

                                PARTIAL HYDROGRAPH   110.00
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```
    RUNOFF VOLUME =      1.29860 INCHES      =         .5843 ACRE-FEET
    PEAK DISCHARGE RATE =       17.56 CFS  AT   1.500 HOURS   BASIN AREA =    .0084 SQ. MI.


*S BASIN 111: PARK
COMPUTE NM HYD       ID=20  HYD NO=111.0  AREA=0.003149 SQ MI
                     PER A=33  PER B=19  PER C=19  PER D=29
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   3.6054    CFS   UNIT VOLUME =    .9961       B =   526.28      P60 = 1.8700
    AREA =      .000913 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   5.2171    CFS   UNIT VOLUME =    .9973       B =   311.05      P60 = 1.8700
    AREA =      .002236 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=20  CODE=1

                                 PARTIAL HYDROGRAPH   111.00

    RUNOFF VOLUME =      1.00753 INCHES      =         .1692 ACRE-FEET
    PEAK DISCHARGE RATE =        5.20 CFS  AT   1.500 HOURS   BASIN AREA =    .0031 SQ. MI.


*S BASIN 112: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=1  HYD NO=112.0  AREA=0.002915 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   4.8336    CFS   UNIT VOLUME =    .9969       B =   526.28      P60 = 1.8700
    AREA =      .001224 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   4.4984    CFS   UNIT VOLUME =    .9975       B =   354.67      P60 = 1.8700
    AREA =      .001691 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1  CODE=1

                                 PARTIAL HYDROGRAPH   112.00


    RUNOFF VOLUME =      1.29860 INCHES      =         .2019 ACRE-FEET
    PEAK DISCHARGE RATE =        6.08 CFS  AT   1.500 HOURS   BASIN AREA =    .0029 SQ. MI.
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```
*S COMBINE BASINS 111 AND 112 TOGETHER
ADD HYD              ID=2  HYD NO=112.1  ID=20  ID=1
PRINT HYD            ID=2  CODE=1

                                PARTIAL HYDROGRAPH   112.10

    RUNOFF VOLUME =      1.14736 INCHES      =         .3711 ACRE-FEET
    PEAK DISCHARGE RATE =       11.27 CFS  AT   1.500 HOURS   BASIN AREA =   .0061 SQ. MI.


*S BASIN 113: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=3  HYD NO=113.0  AREA=0.006265 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.389    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 = 1.8700
    AREA =      .002631 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   9.6681    CFS   UNIT VOLUME =    .9991       B =   354.67      P60 = 1.8700
    AREA =      .003634 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=3  CODE=1

                                PARTIAL HYDROGRAPH   113.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .4339 ACRE-FEET
    PEAK DISCHARGE RATE =       13.04 CFS  AT   1.500 HOURS   BASIN AREA =   .0063 SQ. MI.


*S COMBINE BASINS 113 AND 118 TOGETHER
ADD HYD              ID=4  HYD NO=113.1  ID=3  ID=18
PRINT HYD            ID=4  CODE=1

                                PARTIAL HYDROGRAPH   113.10

    RUNOFF VOLUME =      1.29855 INCHES      =        1.4106 ACRE-FEET
    PEAK DISCHARGE RATE =       42.40 CFS  AT   1.500 HOURS   BASIN AREA =   .0204 SQ. MI.


*S COMBINE BASINS 113 AND 118 TOGETHER
ADD HYD              ID=5  HYD NO=113.2  ID=3  ID=18
PRINT HYD            ID=5  CODE=1
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                                PARTIAL HYDROGRAPH   113.20

    RUNOFF VOLUME =     1.29855 INCHES     =       1.4106 ACRE-FEET
    PEAK DISCHARGE RATE =      42.40 CFS  AT   1.500 HOURS   BASIN AREA =   .0204 SQ. MI.


*S BASIN 114: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=6  HYD NO=114.0  AREA=0.00737 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   12.221    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .003095 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   11.373    CFS   UNIT VOLUME =    .9993       B =   354.67      P60 = 1.8700
    AREA =      .004275 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=6  CODE=1

                                PARTIAL HYDROGRAPH   114.00

    RUNOFF VOLUME =     1.29860 INCHES     =        .5104 ACRE-FEET
    PEAK DISCHARGE RATE =      15.34 CFS  AT   1.500 HOURS   BASIN AREA =   .0074 SQ. MI.


*S COMBINE BASINS 110 AND 114 TOGETHER
ADD HYD              ID=7  HYD NO=114.1  ID=19  ID=6
PRINT HYD            ID=7  CODE=1

                                PARTIAL HYDROGRAPH   114.10

    RUNOFF VOLUME =     1.29856 INCHES     =       1.0947 ACRE-FEET
    PEAK DISCHARGE RATE =      32.90 CFS  AT   1.500 HOURS   BASIN AREA =   .0158 SQ. MI.


*S COMBINE HYDROGRAPH NO 113.2 AND 114.1 TOGETHER
ADD HYD              ID=8  HYD NO=114.2  ID=5  ID=7
PRINT HYD            ID=8  CODE=1

                                PARTIAL HYDROGRAPH   114.20
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    RUNOFF VOLUME =      1.29856 INCHES      =        2.5053 ACRE-FEET
    PEAK DISCHARGE RATE =       75.29 CFS  AT   1.500 HOURS   BASIN AREA =   .0362 SQ. MI.


*S COMBINE HYDROGRAPH NO 107.2 AND 114.2 TOGETHER
ADD HYD              ID=9  HYD NO=114.3  ID=15  ID=8
PRINT HYD            ID=9  CODE=1

                                PARTIAL HYDROGRAPH   114.30


    RUNOFF VOLUME =      1.29855 INCHES      =        5.7657 ACRE-FEET
    PEAK DISCHARGE RATE =      173.31 CFS  AT   1.500 HOURS   BASIN AREA =   .0833 SQ. MI.


*S BASIN 120.1: UNSER BLVD. (OFFSITE)
COMPUTE NM HYD       ID=10  HYD NO=120.1  AREA=0.001098 SQ MI
                     PER A=0  PER B=5  PER C=5  PER D=90
                     TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    3.9015    CFS   UNIT VOLUME =     .9965       B =   526.28      P60 = 1.8700
    AREA =       .000988 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    .29214    CFS   UNIT VOLUME =     .9562       B =   354.67      P60 = 1.8700
    AREA =       .000110 SQ MI    IA =     .42500 INCHES    INF =    1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=10  CODE=1

                                PARTIAL HYDROGRAPH   120.10


    RUNOFF VOLUME =      1.85050 INCHES      =         .1084 ACRE-FEET
    PEAK DISCHARGE RATE =        2.95 CFS  AT   1.500 HOURS   BASIN AREA =   .0011 SQ. MI.


*S BASIN 120.2: UNSER BLVD. (OFFSITE)
COMPUTE NM HYD       ID=11  HYD NO=120.2  AREA=0.004593 SQ MI
                     PER A=0  PER B=5  PER C=5  PER D=90
                     TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    16.320    CFS   UNIT VOLUME =     .9987       B =   526.28      P60 = 1.8700
    AREA =       .004134 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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```
    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   1.2220    CFS   UNIT VOLUME =     .9896       B =   354.67      P60 = 1.8700
    AREA =       .000459 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=11  CODE=1

                                  PARTIAL HYDROGRAPH   120.20


    RUNOFF VOLUME =     1.85050 INCHES     =         .4533 ACRE-FEET
    PEAK DISCHARGE RATE =      12.29 CFS  AT   1.500 HOURS   BASIN AREA =   .0046 SQ. MI.


FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 08:14:02
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =04/21/1997
INPUT FILE = DESRT10.DAT USER NO.= ISCARFNM.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	PAGE = 1
*S	DESERT FLOWER SUBDIVISION - 100 YR POST DEVELOPMENT										
*S	DESRT10.DAT										
*S	BY: JASON NGUYEN										
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.470
*S BASIN 100: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES											
COMPUTE NM HYD	100.00	-	1	.00608	7.23	.229	.70640	1.500	1.858	PER IMP=	42.00
*S BASIN 101: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES											
COMPUTE NM HYD	101.00	-	2	.00432	5.14	.163	.70639	1.500	1.859	PER IMP=	42.00
*S COMBINE BASINS 100 AND 101 TOGETHER											
ADD HYD	101.10	1& 2	3	.01040	12.37	.392	.70634	1.500	1.858		
*S BASIN 102: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES											
COMPUTE NM HYD	102.00	-	4	.00728	8.66	.274	.70639	1.500	1.857	PER IMP=	42.00
*S COMBINE BASIN 102 TO HYDROGRAPH NO 101.1											
ADD HYD	102.10	3& 4	5	.01769	21.03	.666	.70634	1.500	1.858		
*S BASIN 103: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES											
COMPUTE NM HYD	103.00	-	6	.00953	11.33	.359	.70639	1.500	1.857	PER IMP=	42.00
*S COMBINE BASINS 103 AND HYDROGRAPH NO. 102.1 TOGETHER											
ADD HYD	103.10	5& 6	7	.02722	32.35	1.025	.70635	1.500	1.858		
*S BASIN 104: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES											
COMPUTE NM HYD	140.00	-	8	.00470	5.59	.177	.70639	1.500	1.859	PER IMP=	42.00
*S COMBINE BASIN 104 AND HYDROGRAPH 103.1 TOGETHER											
ADD HYD	104.10	7& 8	9	.03191	37.94	1.202	.70635	1.500	1.858		
*S BASIN 105: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES											
COMPUTE NM HYD	105.00	-	10	.00503	5.98	.190	.70639	1.500	1.858	PER IMP=	42.00
*S BASIN 106: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES											
COMPUTE NM HYD	106.10	-	11	.00390	4.64	.147	.70639	1.500	1.859	PER IMP=	42.00
*S COMBINE BASINS 106 AND 105 TOGETHER											
ADD HYD	106.10	10&11	12	.00893	10.62	.336	.70633	1.500	1.859		
*S BASIN 107: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES											
COMPUTE NM HYD	107.00	-	13	.00623	7.41	.235	.70639	1.500	1.858	PER IMP=	42.00
*S COMBINE BASIN 107 AND HYDROGRAPH NO 104.1 TOGETHER											
ADD HYD	107.10	13& 9	14	.03815	45.36	1.437	.70635	1.500	1.858		
*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER											
ADD HYD	107.20	12&14	15	.04708	55.98	1.774	.70634	1.500	1.858		
*S COMBINE HYDROGRAPH NO 106.1 AND 107.1 TOGETHER											
ADD HYD	107.20	12&14	15	.04708	55.98	1.774	.70634	1.500	1.858		
*S BASIN 108: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES											
COMPUTE NM HYD	108.00	-	16	.00738	8.78	.278	.70639	1.500	1.857	PER IMP=	42.00
*S BASIN 109: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES											
COMPUTE NM HYD	109.00	-	17	.00672	7.99	.253	.70639	1.500	1.858	PER IMP=	42.00
*S COMBINE BASINS 108 AND 109 TOGETHER											
ADD HYD	109.10	16&17	18	.01410	16.77	.531	.70635	1.500	1.858		
*S BASIN 110: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES											
COMPUTE NM HYD	110.00	-	19	.00844	10.03	.318	.70639	1.500	1.857	PER IMP=	42.00
*S BASIN 111: PARK											
COMPUTE NM HYD	111.00	-	20	.00315	2.60	.084	.49728	1.500	1.290	PER IMP=	29.00
*S BASIN 112: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES											
COMPUTE NM HYD	112.00	-	1	.00292	3.47	.110	.70639	1.500	1.860	PER IMP=	42.00
*S COMBINE BASINS 111 AND 112 TOGETHER											

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	112.10	20& 1	2	.00606	6.07	.193	.59771	1.500	1.564	
*S BASIN 113: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	113.00	-	3	.00627	7.45	.236	.70639	1.500	1.858	PER IMP= 42.00
*S COMBINE BASINS 113 AND 118 TOGETHER										
ADD HYD	113.10	3&18	4	.02037	24.21	.767	.70635	1.500	1.858	
*S COMBINE BASINS 113 AND 118 TOGETHER										
ADD HYD	113.20	3&18	5	.02037	24.21	.767	.70635	1.500	1.858	
*S BASIN 114: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES										
COMPUTE NM HYD	114.00	-	6	.00737	8.76	.278	.70639	1.500	1.857	PER IMP= 42.00
*S COMBINE BASINS 110 AND 114 TOGETHER										
ADD HYD	114.10	19& 6	7	.01581	18.79	.595	.70636	1.500	1.857	
*S COMBINE HYDROGRAPH NO 113.2 AND 114.1 TOGETHER										
ADD HYD	114.20	5& 7	8	.03617	43.00	1.363	.70635	1.500	1.857	
*S COMBINE HYDROGRAPH NO 107.2 AND 114.2 TOGETHER										
ADD HYD	114.30	15& 8	9	.08325	98.98	3.136	.70635	1.500	1.858	
*S BASIN 120.1: UNSER BLVD. (OFFSITE)										
COMPUTE NM HYD	120.10	-	10	.00110	1.93	.067	1.14638	1.500	2.745	PER IMP= 90.00
*S BASIN 120.2: UNSER BLVD. (OFFSITE)										
COMPUTE NM HYD	120.20	-	11	.00459	8.04	.281	1.14638	1.500	2.735	PER IMP= 90.00
FINISH										

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AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 04/16/1997
     START TIME (HR:MIN:SEC) = 13:26:24     USER NO.= ISCARFNM.I01
     INPUT FILE = DESRT10.DAT

*S                 DESERT FLOWER SUBDIVISION - 100 YR POST DEVELOPMENT
*S                 DESRT10.DAT
*S                 BY: JASON NGUYEN
*
START              RAINFALL BEGINS AT 0.0 HRS
RAINFALL           TYPE=1 RAIN QUARTER=0 RAIN ONE=1.26
                   RAIN SIX=1.47 RAIN DAY=2.66 DT=0.03333HR

            COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
            DT =     .033330 HOURS       END TIME =     5.999400 HOURS
               .0000   .0010   .0020   .0030   .0040   .0051   .0062
               .0073   .0085   .0096   .0109   .0121   .0134   .0147
               .0160   .0174   .0188   .0203   .0218   .0234   .0250
               .0267   .0285   .0303   .0322   .0342   .0363   .0385
               .0408   .0432   .0458   .0492   .0530   .0569   .0655
               .0846   .1140   .1563   .2140   .2898   .3864   .5068
               .6537   .7901   .8470   .8951   .9378   .9767  1.0126
              1.0458  1.0769  1.1060  1.1334  1.1593  1.1837  1.2068
              1.2287  1.2495  1.2692  1.2879  1.3057  1.3098  1.3135
              1.3171  1.3205  1.3238  1.3269  1.3299  1.3328  1.3355
              1.3382  1.3408  1.3433  1.3457  1.3481  1.3504  1.3526
              1.3548  1.3569  1.3590  1.3610  1.3629  1.3649  1.3667
              1.3686  1.3704  1.3722  1.3739  1.3756  1.3773  1.3789
              1.3805  1.3821  1.3837  1.3852  1.3867  1.3882  1.3897
              1.3911  1.3925  1.3939  1.3953  1.3967  1.3980  1.3993
              1.4006  1.4019  1.4032  1.4045  1.4057  1.4069  1.4081
              1.4093  1.4105  1.4117  1.4128  1.4140  1.4151  1.4162
              1.4174  1.4184  1.4195  1.4206  1.4217  1.4227  1.4238
              1.4248  1.4258  1.4268  1.4278  1.4288  1.4298  1.4308
              1.4318  1.4327  1.4337  1.4346  1.4356  1.4365  1.4374
              1.4383  1.4392  1.4401  1.4410  1.4419  1.4428  1.4437
              1.4445  1.4454  1.4462  1.4471  1.4479  1.4487  1.4496
              1.4504  1.4512  1.4520  1.4528  1.4536  1.4544  1.4552
              1.4560  1.4568  1.4575  1.4583  1.4591  1.4598  1.4606
              1.4613  1.4621  1.4628  1.4636  1.4643  1.4650  1.4657
              1.4665  1.4672  1.4679  1.4686  1.4693  1.4700

*S BASIN 100: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD     ID=1 HYD NO=100.00 AREA=0.01413 SQ MI
                   PER A=0 PER B=29 PER C=29 PER D=42
                   TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   23.430    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.2600
    AREA =      .005935 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   20.904    CFS   UNIT VOLUME =    .9996       B =   340.01      P60 = 1.2600
    AREA =      .008195 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1   CODE=1

                                  PARTIAL HYDROGRAPH   100.00


    RUNOFF VOLUME =      .70639 INCHES     =        .5323 ACRE-FEET
    PEAK DISCHARGE RATE =      16.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0141 SQ. MI.


*S BASIN 110: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=2 HYD NO=101.00 AREA=0.01818 SQ MI
                    PER A=33 PER B=19 PER C=19 PER D=29
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   20.815    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.2600
    AREA =      .005272 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .150031HR    TP =   .133300HR    K/TP RATIO =  1.125516     SHAPE CONSTANT, N =  3.143803
    UNIT PEAK =   28.405    CFS   UNIT VOLUME =    .9995       B =   293.34      P60 = 1.2600
    AREA =      .012908 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=2   CODE=1

                                  PARTIAL HYDROGRAPH   101.00


    RUNOFF VOLUME =      .49728 INCHES     =        .4822 ACRE-FEET
    PEAK DISCHARGE RATE =      14.97 CFS  AT   1.500 HOURS   BASIN AREA =   .0182 SQ. MI.


*S BASIN 120: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=3 HYD NO=120.00 AREA=0.01769 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   29.333    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 = 1.2600
    AREA =      .007430 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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```
    K =    .124821HR     TP =    .133300HR     K/TP RATIO =    .936388      SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =    26.171     CFS    UNIT VOLUME =     .9997        B =    340.01       P60 = 1.2600
    AREA =       .010260 SQ MI     IA =     .42500 INCHES     INF =    1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=3   CODE=1

                                   PARTIAL HYDROGRAPH   120.00


    RUNOFF VOLUME =       .70639 INCHES      =         .6665 ACRE-FEET
    PEAK DISCHARGE RATE =       21.02 CFS  AT   1.500 HOURS   BASIN AREA =    .0177 SQ. MI.


*S BASIN 130: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=4 HYD NO=130.00 AREA=0.01965 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    22.498     CFS    UNIT VOLUME =     .9988        B =    526.28       P60 = 1.2600
    AREA =       .005699 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

    K =    .150031HR     TP =    .133300HR     K/TP RATIO =   1.125516      SHAPE CONSTANT, N =  3.143803
    UNIT PEAK =    30.702     CFS    UNIT VOLUME =     .9995        B =    293.34       P60 = 1.2600
    AREA =       .013952 SQ MI     IA =     .52958 INCHES     INF =    1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=4   CODE=1

                                   PARTIAL HYDROGRAPH   130.00


    RUNOFF VOLUME =       .49728 INCHES      =         .5211 ACRE-FEET
    PEAK DISCHARGE RATE =       16.18 CFS  AT   1.500 HOURS   BASIN AREA =    .0197 SQ. MI.


*S COMBINE BASINS 120 AND 130 TOGETHER
ADD HYD              ID=5  HYD NO=103.1 ID=3  ID=4
PRINT HYD            ID=5  CODE=1

                                   PARTIAL HYDROGRAPH   103.10


    RUNOFF VOLUME =       .59634 INCHES      =        1.1876 ACRE-FEET
    PEAK DISCHARGE RATE =       37.20 CFS  AT   1.500 HOURS   BASIN AREA =    .0373 SQ. MI.
```

```
*S BASIN 140: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=6 HYD NO=140.00 AREA=0.00737 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   8.4382    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.2600
    AREA =      .002137 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .150031HR    TP =   .133300HR    K/TP RATIO =  1.125516     SHAPE CONSTANT, N =  3.143803
    UNIT PEAK =   11.515    CFS   UNIT VOLUME =    .9988       B =   293.34      P60 = 1.2600
    AREA =      .005233 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=6   CODE=1

                                  PARTIAL HYDROGRAPH   140.00


    RUNOFF VOLUME =      .49728 INCHES     =        .1955 ACRE-FEET
    PEAK DISCHARGE RATE =       6.07 CFS  AT   1.500 HOURS   BASIN AREA =   .0074 SQ. MI.


*S BASIN 150: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=7 HYD NO=150.00 AREA=0.009123 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   15.128    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 = 1.2600
    AREA =      .003832 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124821HR    TP =   .133300HR    K/TP RATIO =   .936388     SHAPE CONSTANT, N =  3.776847
    UNIT PEAK =   13.497    CFS   UNIT VOLUME =    .9993       B =   340.01      P60 = 1.2600
    AREA =      .005291 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=7   CODE=1

                                  PARTIAL HYDROGRAPH   150.00


    RUNOFF VOLUME =      .70640 INCHES     =        .3437 ACRE-FEET
    PEAK DISCHARGE RATE =      10.84 CFS  AT   1.500 HOURS   BASIN AREA =   .0091 SQ. MI.
```

```
*S BASIN 150.1: PROPOSED PARK
COMPUTE NM HYD       ID=8 HYD NO=150.10 AREA=0.003205 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   3.6695    CFS   UNIT VOLUME =    .9961       B =   526.28      P60 = 1.2600
    AREA =      .000929 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .150031HR    TP =   .133300HR    K/TP RATIO =  1.125516    . SHAPE CONSTANT, N =  3.143803
    UNIT PEAK =   5.0076    CFS   UNIT VOLUME =    .9970       B =   293.34      P60 = 1.2600
    AREA =      .002276 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=8   CODE=1

                                   PARTIAL HYDROGRAPH   150.10


    RUNOFF VOLUME =      .49728 INCHES     =        .0850 ACRE-FEET
    PEAK DISCHARGE RATE =       2.65 CFS  AT   1.500 HOURS   BASIN AREA =   .0032 SQ. MI.


*S COMBINE BASINS 150 AND 150.1 TOGETHER
ADD HYD              ID=9  HYD NO=150.05  ID=7  ID=8
PRINT HYD            ID=9  CODE=1

                                   PARTIAL HYDROGRAPH   150.05


    RUNOFF VOLUME =      .65198 INCHES     =        .4287 ACRE-FEET
    PEAK DISCHARGE RATE =      13.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0123 SQ. MI.


*S COMBINE BASIN 100 AND HYDROGRAPH NO 150.05 TOGETHER
ADD HYD              ID=10  HYD NO=150.06  ID=1  ID=9
PRINT HYD            ID=10  CODE=1

                                   PARTIAL HYDROGRAPH   150.06


    RUNOFF VOLUME =      .68103 INCHES     =        .9610 ACRE-FEET
    PEAK DISCHARGE RATE =      30.28 CFS  AT   1.500 HOURS   BASIN AREA =   .0265 SQ. MI.


*S BASIN 160: UNSER BLVD.
COMPUTE NM HYD       ID=11  HYD NO=160.0  AREA=0.005691 SQ MI
                     PER A=0  PER B=5  PER C=5  PER D=90
                     TP=-0.1333 HR  MASS RAIN=-1
```

```
K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =    20.222    CFS    UNIT VOLUME =    .9988       B =    526.28      P60 = 1.2600
AREA =       .005122 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


K =    .124821HR    TP =    .133300HR    K/TP RATIO =    .936388     SHAPE CONSTANT, N =  3.776847
UNIT PEAK =    1.4516    CFS    UNIT VOLUME =    .9911       B =    340.01      P60 = 1.2600
AREA =       .000569 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=11  CODE=1

                                PARTIAL HYDROGRAPH   160.00


RUNOFF VOLUME =      1.14638 INCHES      =        .3479 ACRE-FEET
PEAK DISCHARGE RATE =        9.96 CFS  AT   1.500 HOURS   BASIN AREA =    .0057 SQ. MI.


FINISH

NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 13:26:37
```

APPENDIX B

OFFSITE AHYMO SUMMARY & DETAILED OUTPUT

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =04/22/1997
INPUT FILE = DESRTOFF.DAT USER NO.= ISCARFNM.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S										
*S	REVISED BY: JASON NGUYEN									
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.200
*S BASIN 100 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL										
*S BE @ A DENSITY OF 4 DU/AC										
COMPUTE NM HYD	100.00	-	1	.07150	148.70	4.952	1.29860	1.500	3.250	PER IMP= 42.00
*S BASIN 101 IS FULLY DEVELOPED WITH SINGLE FAMILY RESIDENTIAL HOMES										
*S WITH A DENSTIY OF 4 DU/AC										
COMPUTE NM HYD	101.00	-	2	.03700	60.90	1.988	1.00753	1.500	2.572	PER IMP= 29.00
ADD HYD	101.01	1& 2	3	.10850	209.60	6.940	1.19933	1.500	3.018	
*S **AREA 102 IS A MIDDLE SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)										
COMPUTE NM HYD	102.00	-	4	.04000	33.21	.937	.43925	1.533	1.297	PER IMP= .00
*S ROUTE THE SCHOOL'S RUNOFF IN A 28' F-F RESIDENTIAL STREET, S=2%										
*S ASSUME SECTION EXTENDS TO THE ROW LINE ON BOTH SIDES										
ROUTE	102.10	4	5	.04000	32.41	.937	.43927	1.567	1.266	
*S ADD THE ROUTED FLOW FROM 102 TO THE EARLIER TOTAL										
ADD HYD	102.30	3& 5	6	.14850	236.14	7.877	.99460	1.500	2.485	
*S **BASIN 103 IS COMPLETELY DEVELOPED										
COMPUTE NM HYD	103.00	-	7	.04400	72.42	2.364	1.00753	1.500	2.572	PER IMP= 29.00
*S ADD 103 TO TOTAL										
ADD HYD	103.10	6& 7	8	.19250	308.56	10.242	.99755	1.500	2.505	
*S **ASSUME FLOW IS ROUTED IN 28' STREET AS EARLIER										
ROUTE	103.20	8	9	.19250	293.93	10.242	.99756	1.533	2.386	
*S **AREA 104 IS FULLY DEVELOPED										
COMPUTE NM HYD	104.00	-	10	.04400	72.42	2.364	1.00753	1.500	2.572	PER IMP= 29.00
*S ADD THE FLOW TO THE TOTAL										
ADD HYD	104.01	9&10	11	.23650	364.94	12.606	.99941	1.533	2.411	
*S AREA 105 IS A PARK & COA WELL SITE										
COMPUTE NM HYD	105.00	-	12	.02100	29.05	.849	.75825	1.500	2.161	PER IMP= 7.00
ADD HYD	105.10	11&12	13	.25750	393.90	13.455	.97974	1.533	2.390	
*S ROUTE THE FLOW TO THE EXISTING END OF SAPPHIRE ST.										
ROUTE	105.20	13	14	.25750	364.47	13.455	.97974	1.567	2.212	
*S AREA 106 IS FULLY DEVELOPED										
COMPUTE NM HYD	106.00	-	15	.02177	35.84	1.170	1.00753	1.500	2.572	PER IMP= 29.00
*S BASIN 300.1 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @										
*S A DENSITY OF 4 DU/AC										
COMPUTE NM HYD	300.10	-	16	.01560	32.45	1.080	1.29860	1.500	3.250	PER IMP= 42.00
*S **ADD THE FLOWS FROM BASINS 106 AND 300.1										
ADD HYD	106.10	15&16	17	.03737	68.29	2.250	1.12902	1.500	2.855	
*S **TOTAL FLOW IN SAPHIRE ST AT ANALYSIS POINT A										
ADD HYD	106.15	14&17	18	.29487	423.63	15.705	.99866	1.567	2.245	
*S **BASIN 401.12, 401.14, 401.17, 300.2 AND 400.2 DRAINS TO SAPPHIRE ST.										
*S **BASIN 401.12 IS PART OF SUNRISE ESTATES UNIT 1										
COMPUTE NM HYD	401.12	-	19	.01126	23.43	.780	1.29860	1.500	3.251	PER IMP= 42.00
*S **ADD THE FLOWS FROM HYDROGRAPH NO 401.12 AND 106.15										
ADD HYD	401.13	19&18	20	.30613	443.65	16.485	1.00969	1.567	2.264	
*S **BASIN 300.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE										
*S @ A DENSITY OF 4 DU/AC										

```
                          FROM  TO                    PEAK        RUNOFF                TIME TO   CFS
              HYDROGRAPH   ID   ID        AREA     DISCHARGE     VOLUME     RUNOFF      PEAK    PER
COMMAND     IDENTIFICATION NO.  NO.      (SQ MI)     (CFS)       (AC-FT)   (INCHES)    (HOURS)  ACRE     NOTATION

COMPUTE NM HYD      300.20   -    1       .01180       24.55        .817    1.29859     1.500   3.251 PER IMP=  42.00
*S ** BASIN 401.14 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD      401.14   -    4       .01117       23.24        .774    1.29860     1.500   3.251 PER IMP=  42.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.14 AND 300.2
ADD HYD             401.15  4& 1   5       .02297       47.79       1.591    1.29857     1.500   3.251
*S **ADD FLOWS FROM HYDROGRAPH NO 401.15 AND 401.13
ADD HYD             401.16  5&20   6       .32910      484.48      18.076    1.02985     1.567   2.300
*S **BASIN 401.17 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD      401.17   -    7       .00661       13.76        .458    1.29860     1.500   3.252 PER IMP=  42.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.16 AND 401.17
ADD HYD             401.18  6& 7   8       .33571      496.23      18.534    1.03514     1.567   2.310
*S **BASINS 200,201, & 202 DRAIN TO KIMELA DR
COMPUTE NM HYD      200.00   -   17       .05300       87.23       2.848    1.00753     1.500   2.572 PER IMP=  29.00
*S **ROUTE FLOW TO THE END OF KIMELA DR.
ROUTE               200.10   17  18       .05300       86.94       2.848    1.00753     1.533   2.563
COMPUTE NM HYD      201.00   -    1       .02600       42.80       1.397    1.00753     1.500   2.572 PER IMP=  29.00
ADD HYD             201.10  1&18  18       .07900      128.91       4.245    1.00752     1.533   2.550
*S **BASIN 202 IS AN ELEMENTARY SCHOOL,(ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD      202.00   -   19       .00925        7.69        .217     .43925     1.533   1.298 PER IMP=   .00
*S **BASIN 202.05 IS THE ELEMENTARY SCHOOL PARKING LOT THAT WILL DRAIN TO KIMELA
COMPUTE NM HYD      202.05   -    1       .00375       10.49        .393    1.96548     1.500   4.373 PER IMP= 100.00
*S **ADD THE BASINS OF THE ELEMENTARY SCHOOL AND PARKING LOT
ADD HYD             202.06 19& 1   2       .01300       18.01        .610     .87913     1.500   2.164
*S **ADD THE BASINS TOGETHER TO GET THE FLOW IN KIMELA DR @ ANALYSIS PT B
ADD HYD             202.10 18& 2  20       .09200      146.56       4.855     .98938     1.533   2.489
*S DIVIDE HYDROGRAPH FOR STREET FLOW & SD FLOW
DIVIDE HYD          202.20   20  11       .07361       72.00       3.884     .98938     1.433   1.528
                    202.30  AND  12       .01839       74.56        .971     .98938     1.533   6.333
*S **ROUTE 72 CFS IN EXTENDED KIMELA DR TO THE PROPOSED UNSER RD
ROUTE               202.40   11  13       .07361       72.25       3.884     .98939     1.533   1.534
*S **ROUTE REMANING FLOW IN 48" SD TO UNSER
ROUTE               202.50   12  14       .01839       75.85        .971     .98966     1.533   6.443
*S **ADD THE FLOWS BACK TOGETHER FOR A TOTAL Q
ADD HYD             202.60 13&14  15       .09200      148.10       4.855     .98943     1.533   2.515
*S **BASINS 400 THRU 407 ARE CURRENTLY UNDEVELOPED, FOR PURPOSES
*S OF THIS REPORT, ASSUME ALL BASINS WILL BE BUILT OUT @ THEIR CURRENT
*S ZONING
COMPUTE NM HYD      400.10   -   16       .03140       65.30       2.175    1.29860     1.500   3.250 PER IMP=  42.00
*S **COMPUTE BASIN 400.2
COMPUTE NM HYD      400.20   -   17       .03260       67.80       2.258    1.29860     1.500   3.250 PER IMP=  42.00
*S **BASIN 402 IS UNIT 2 OF SUNRISE ESTATES
COMPUTE NM HYD      402.00   -    5       .05200      108.14       3.601    1.29860     1.500   3.249 PER IMP=  42.00
*S **ADD BASIN 402 TO THE TOTAL FLOW @ THE END OF EXTENDED KIMELA
ADD HYD             402.10  5&15   6       .14400      252.75       8.456    1.10107     1.533   2.743
*S **ASSUME BASINS 403 THRU 407 WILL DEVELOP @ 4 DU/AC
COMPUTE NM HYD      403.00   -    7       .01480       30.79       1.025    1.29860     1.500   3.250 PER IMP=  42.00
*S **ADD FLOW TO THAT IN SAPPHIRE ST
ADD HYD             403.10  8& 7   8       .35051      522.54      19.559    1.04627     1.567   2.329
COMPUTE NM HYD      404.00   -    9       .01080       22.47        .748    1.29860     1.500   3.251 PER IMP=  42.00
*S **ADD FLOW TO THAT IN KIMELA DR
ADD HYD             404.10  6& 9  10       .15480      274.50       9.204    1.11485     1.533   2.771
*S **BASIN 405 DRAINS TO THE SOUTH
```

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
COMPUTE NM HYD	405.00	-	11	.01410	29.33	.977	1.29860	1.500	3.250	PER IMP= 42.00
*S **ADD TO FLOW IN SAPPHIRE										
ADD HYD	405.10	8&11	12	.36461	547.59	20.535	1.05602	1.567	2.347	
*S ROUTE FLOW IN KIMELA UP TO TOTAL FLOW @ SAPPHIRE & ARENAL										
ROUTE	404.30	10	2	.15480	266.36	9.204	1.11485	1.533	2.689	
*S **ADD FLOWS FROM BASIN 400.2 AND THE FLOWS ABOVE										
ADD HYD	400.21	17& 2	6	.18740	331.97	11.462	1.14681	1.533	2.768	
*S **ADD THE FLOWS BACK TOGETHER FOR A TOTAL Q										
ADD HYD	405.30	6&12	3	.55201	873.78	31.997	1.08685	1.533	2.473	
*S DESIGN A RETENTION FACILITY TO REDUCE TO FLOW TO THAT WHICH WILL										
*S FIT IN A 66" RCP @ S=1.8%										
ROUTE RESERVOIR	405.40	3	4	.55201	441.93	31.997	1.08684	1.766	1.251	AC-FT= 12.149
*S ROUTE FLOW FROM THE DETENTION POND TO THE AMOLE DEL NORTE CHANNEL										
ROUTE	405.30	4	5	.55201	442.00	31.997	1.08684	1.766	1.251	
*S **CALC BASIN 406 (WEST PORTION OF VALLEY SOUTH)										
COMPUTE NM HYD	406.00	-	13	.05650	117.49	3.913	1.29860	1.500	3.249	PER IMP= 42.00
*S **CALC BASIN 407										
COMPUTE NM HYD	407.00	-	16	.05040	104.81	3.491	1.29860	1.500	3.249	PER IMP= 42.00
*S **COMBINE BASINS 406 AND 407 TOGETHER										
ADD HYD	406.10	13&16	14	.10690	222.30	7.404	1.29859	1.500	3.249	
*S ROUTE FLOW FROM BASINS 406 AND 407 TO AMOLE DEL NORTE CHANNEL										
ROUTE	406.10	14	15	.10690	122.02	7.404	1.29860	1.633	1.783	
*S **CALC BASIN 408										
COMPUTE NM HYD	408.00	-	17	.03563	74.10	2.468	1.29860	1.500	3.249	PER IMP= 42.00
*S ROUTE FLOW FROM BASINS 408 TO THE AMOLE DEL NORTE CHANNEL										
ROUTE	408.10	17	1	.03563	62.47	2.468	1.29860	1.567	2.739	
FINISH										

```
AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 04/22/1997
     START TIME (HR:MIN:SEC) = 13:23:14     USER NO.= ISCARFNM.I01
     INPUT FILE = DESRTOFF.DAT

*S
*S                  REVISED BY: JASON NGUYEN
*
START               RAINFALL BEGINS AT 0.0 HRS
RAINFALL            TYPE=1 RAIN QUARTER=0 RAIN ONE=1.87
                    RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333HR

              COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
              DT =     .033330 HOURS       END TIME =     5.999400 HOURS
                 .0000   .0016   .0033   .0050   .0067   .0085   .0103
                 .0122   .0141   .0160   .0180   .0201   .0222   .0243
                 .0266   .0289   .0312   .0337   .0362   .0388   .0415
                 .0443   .0472   .0502   .0534   .0567   .0601   .0637
                 .0675   .0715   .0758   .0809   .0865   .0924   .1050
                 .1334   .1771   .2398   .3254   .4379   .5814   .7600
                 .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
                1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
                1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
                1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
                1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
                2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
                2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
                2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
                2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
                2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
                2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  2.1159
                2.1176  2.1193  2.1210  2.1227  2.1244  2.1260  2.1276
                2.1292  2.1308  2.1324  2.1340  2.1355  2.1371  2.1386
                2.1401  2.1416  2.1431  2.1446  2.1460  2.1475  2.1489
                2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
                2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
                2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
                2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
                2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
                2.1944  2.1956  2.1967  2.1978  2.1989  2.2000

*S BASIN 100 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL
*S BE @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD      ID=1 HYD NO=100.00 AREA=0.0715 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072801HR    TP =   .133300HR    K/TP RATIO =   .546145     SHAPE CONSTANT, N =  7.087329
    UNIT PEAK =   118.36    CFS   UNIT VOLUME =    .9992       B =   525.38      P60 = 1.8700
    AREA =      .030030 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
    K =    .118190HR    TP =    .133300HR    K/TP RATIO =    .886648     SHAPE CONSTANT, N =  4.001119
    UNIT PEAK =   110.52    CFS   UNIT VOLUME =    1.000       B =   355.24      P60 = 1.8700
    AREA =       .041470 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1   CODE=1

                                   PARTIAL HYDROGRAPH   100.00


    RUNOFF VOLUME =     1.29860 INCHES     =       4.9519 ACRE-FEET
    PEAK DISCHARGE RATE =     148.70 CFS  AT   1.500 HOURS   BASIN AREA =   .0715 SQ. MI.


*S BASIN 101 IS FULLY DEVELOPED WITH SINGLE FAMILY RESIDENTIAL HOMES
*S WITH A DENSTIY OF 4 DU/AC
COMPUTE NM HYD       ID=2 HYD NO=101.00 AREA=0.0370 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   42.363    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 = 1.8700
    AREA =       .010730 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =    .139463HR    TP =    .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   61.299    CFS   UNIT VOLUME =    .9998       B =   311.05      P60 = 1.8700
    AREA =       .026270 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=2   CODE=1

                                   PARTIAL HYDROGRAPH   101.00


    RUNOFF VOLUME =     1.00753 INCHES     =       1.9882 ACRE-FEET
    PEAK DISCHARGE RATE =      60.90 CFS  AT   1.500 HOURS   BASIN AREA =   .0370 SQ. MI.


ADD HYD              ID=3 HYD NO=101.01 ID=1 ID=2
PRINT HYD            ID=3 CODE=1

                                   PARTIAL HYDROGRAPH   101.01


    RUNOFF VOLUME =     1.19933 INCHES     =       6.9401 ACRE-FEET
    PEAK DISCHARGE RATE =     209.60 CFS  AT   1.500 HOURS   BASIN AREA =   .1085 SQ. MI.
```

```
*S **AREA 102 IS A MIDDLE SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD       ID=4 HYD NO=102.00 AREA=0.040 SQ MI
                     PER A=100 PER B=0 PER C=0 PER D=0
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .163684HR    TP =   .133300HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   82.084    CFS   UNIT VOLUME =    .9995       B =   273.54      P60 = 1.8700
    AREA =      .040000 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=4   CODE=1

                                  PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =      .43925 INCHES     =        .9371 ACRE-FEET
    PEAK DISCHARGE RATE =      33.21 CFS  AT   1.533 HOURS   BASIN AREA =   .0400 SQ. MI.


*S ROUTE THE SCHOOL'S RUNOFF IN A 28' F-F RESIDENTIAL STREET, S=2%
*S ASSUME SECTION EXTENDS TO THE ROW LINE ON BOTH SIDES
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME  ID=5 REACH NO=1 NO VS=1 L=650 FT SLP=0.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.1670
.105	.554	.95	.1052
.158	1.246	2.80	.0803
.211	2.215	6.03	.0663
.263	3.461	10.94	.0571
.316	4.920	18.84	.0472
.368	6.394	29.08	.0397
.421	7.869	41.00	.0347
.474	9.344	54.46	.0310
.526	10.821	69.37	.0282
.579	12.298	85.66	.0259
.632	13.776	103.24	.0241
.684	15.261	119.89	.0230
.737	16.869	132.52	.0230
.790	18.644	147.34	.0228
.842	20.586	164.39	.0226
.895	22.695	183.72	.0223
.947	24.971	205.41	.0219
1.000	27.414	229.56	.0216

```
ROUTE                ID=5 HYD NO=102.1 INFLOW ID=4 DT=0.0
PRINT HYD            ID=5 CODE=1
```

PARTIAL HYDROGRAPH 102.10

RUNOFF VOLUME = .43927 INCHES = .9371 ACRE-FEET
PEAK DISCHARGE RATE = 32.41 CFS AT 1.567 HOURS BASIN AREA = .0400 SQ. MI.

```
*S ADD THE ROUTED FLOW FROM 102 TO THE EARLIER TOTAL
ADD HYD              ID=6 HYD NO=102.3 ID=3 ID=5
PRINT HYD            ID=6 CODE=1
```

PARTIAL HYDROGRAPH 102.30

RUNOFF VOLUME = .99460 INCHES = 7.8772 ACRE-FEET
PEAK DISCHARGE RATE = 236.14 CFS AT 1.500 HOURS BASIN AREA = .1485 SQ. MI.

```
*S **BASIN 103 IS COMPLETELY DEVELOPED
COMPUTE NM HYD       ID=7 HYD NO=103.00 AREA=0.044 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1
```

```
K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   50.377    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
AREA =      .012760 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
UNIT PEAK =   72.896    CFS   UNIT VOLUME =    .9999       B =   311.05      P60 = 1.8700
AREA =      .031240 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=7   CODE=1

                                PARTIAL HYDROGRAPH   103.00


RUNOFF VOLUME =     1.00753 INCHES     =       2.3643 ACRE-FEET
PEAK DISCHARGE RATE =      72.42 CFS  AT   1.500 HOURS   BASIN AREA =   .0440 SQ. MI.


*S ADD 103 TO TOTAL
ADD HYD             ID=8 HYD NO=103.1 ID=6 ID=7
PRINT HYD           ID=8 CODE=1

                                PARTIAL HYDROGRAPH   103.10


RUNOFF VOLUME =      .99755 INCHES     =      10.2415 ACRE-FEET
PEAK DISCHARGE RATE =     308.56 CFS  AT   1.500 HOURS   BASIN AREA =   .1925 SQ. MI.


*S **ASSUME FLOW IS ROUTED IN 28' STREET AS EARLIER
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER       FLOW        FLOW        TOP
                                  SURFACE      AREA        RATE        WIDTH
                                   ELEV        SQ FT       CFS         FT
                                  100.00        .00         .00         .00
                                  100.05        .14         .15        5.26
                                  100.11        .55         .95       10.52
                                  100.16       1.25        2.80       15.78
                                  100.21       2.22        6.03       21.04
                                  100.26       3.46       10.94       26.30
                                  100.32       4.92       18.84       27.99
                                  100.37       6.39       29.08       28.01
                                  100.42       7.87       41.00       28.03
                                  100.47       9.34       54.46       28.04
```

100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME  ID=9 REACH NO=1 NO VS=1 L=900 FT SLP=0.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.2312
.105	.554	.95	.1457
.158	1.246	2.80	.1112
.211	2.215	6.03	.0918
.263	3.461	10.94	.0791
.316	4.920	18.84	.0653
.368	6.394	29.08	.0550
.421	7.869	41.00	.0480
.474	9.344	54.46	.0429
.526	10.821	69.37	.0390
.579	12.298	85.66	.0359
.632	13.776	103.24	.0334
.684	15.261	119.89	.0318
.737	16.869	132.52	.0318
.790	18.644	147.34	.0316
.842	20.586	164.39	.0313
.895	22.695	183.72	.0309
.947	24.971	205.41	.0304
1.000	27.414	229.56	.0299

```
    ROUTE                ID=9 HYD NO=103.2 INFLOW ID=8 DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD            ID=9 CODE=1
```

PARTIAL HYDROGRAPH 103.20

```
    RUNOFF VOLUME =       .99756 INCHES     =      10.2415 ACRE-FEET
    PEAK DISCHARGE RATE =     293.93 CFS  AT   1.533 HOURS   BASIN AREA =   .1925 SQ. MI.


    *S **AREA 104 IS FULLY DEVELOPED
    COMPUTE NM HYD      ID=10 HYD NO=104.00 AREA=0.044 SQ MI
                        PER A=33 PER B=19 PER C=19 PER D=29
                        TP=-0.1333 HR   MASS RAIN=-1
```

```
    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    50.377    CFS   UNIT VOLUME =     .9992       B =   526.28      P60 = 1.8700
    AREA =       .012760 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .139463HR    TP =    .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =    72.896    CFS   UNIT VOLUME =     .9999       B =   311.05      P60 = 1.8700
    AREA =       .031240 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=10   CODE=1

                                  PARTIAL HYDROGRAPH   104.00


    RUNOFF VOLUME =      1.00753 INCHES      =       2.3643 ACRE-FEET
    PEAK DISCHARGE RATE =       72.42 CFS  AT   1.500 HOURS   BASIN AREA =   .0440 SQ. MI.


*S ADD THE FLOW TO THE TOTAL
ADD HYD              ID=11 HYD NO=104.01 ID=9 ID=10
PRINT HYD            ID=11 CODE=1

                                  PARTIAL HYDROGRAPH   104.01


    RUNOFF VOLUME =       .99941 INCHES      =      12.6058 ACRE-FEET
    PEAK DISCHARGE RATE =      364.94 CFS  AT   1.533 HOURS   BASIN AREA =   .2365 SQ. MI.


*S AREA 105 IS A PARK & COA WELL SITE
COMPUTE NM HYD       ID=12 HYD NO=105.00 AREA=0.021 SQ MI
                     PER A=31 PER B=31 PER C=31 PER D=7
                     TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    5.8036    CFS   UNIT VOLUME =     .9973       B =   526.28      P60 = 1.8700
    AREA =       .001470 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .133514HR    TP =    .133300HR    K/TP RATIO =  1.001607     SHAPE CONSTANT, N =  3.524575
    UNIT PEAK =    47.194    CFS   UNIT VOLUME =    1.000        B =   322.12      P60 = 1.8700
    AREA =       .019530 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=12   CODE=1

                                  PARTIAL HYDROGRAPH   105.00
```

```
    RUNOFF VOLUME =       .75825 INCHES     =         .8492 ACRE-FEET
    PEAK DISCHARGE RATE =      29.05 CFS  AT   1.500 HOURS   BASIN AREA =   .0210 SQ. MI.


ADD HYD              ID=13 HYD NO=105.1 ID=11 ID=12
PRINT HYD            ID=13 CODE=1

                                  PARTIAL HYDROGRAPH   105.10


    RUNOFF VOLUME =       .97974 INCHES     =      13.4550 ACRE-FEET
    PEAK DISCHARGE RATE =     393.90 CFS  AT   1.533 HOURS   BASIN AREA =   .2575 SQ. MI.


*S ROUTE THE FLOW TO THE EXISTING END OF SAPPHIRE ST.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00

                                  RATING CURVE VALLEY SECTION  1.0
                                      WATER       FLOW        FLOW        TOP
                                     SURFACE      AREA        RATE       WIDTH
                                      ELEV        SQ FT       CFS         FT
                                     100.00         .00         .00         .00
                                     100.05         .14         .15        5.26
                                     100.11         .55         .95       10.52
                                     100.16        1.25        2.80       15.78
                                     100.21        2.22        6.03       21.04
                                     100.26        3.46       10.94       26.30
                                     100.32        4.92       18.84       27.99
                                     100.37        6.39       29.08       28.01
                                     100.42        7.87       41.00       28.03
                                     100.47        9.34       54.46       28.04
                                     100.53       10.82       69.37       28.06
                                     100.58       12.30       85.66       28.07
                                     100.63       13.78      103.24       28.09
                                     100.68       15.26      119.89       28.96
                                     100.74       16.87      132.52       32.13
                                     100.79       18.64      147.34       35.31
                                     100.84       20.59      164.39       38.48
                                     100.89       22.69      183.72       41.66
                                     100.95       24.97      205.41       44.83
                                     101.00       27.41      229.56       48.00
COMPUTE TRAVEL TIME  ID=14 REACH NO=1 NO VS=1 L=1200 FT SLP=0.02
```

```
TRAVEL TIME TABLE
                    REACH=  1.0

WATER        AVERAGE      FLOW         TRAVEL
DEPTH        AREA         RATE         TIME
FEET         SQ.FT.       CFS          HRS
   .053         .138          .15        .3083
   .105         .554          .95        .1942
   .158        1.246         2.80        .1482
   .211        2.215         6.03        .1223
   .263        3.461        10.94        .1054
   .316        4.920        18.84        .0871
   .368        6.394        29.08        .0733
   .421        7.869        41.00        .0640
   .474        9.344        54.46        .0572
   .526       10.821        69.37        .0520
   .579       12.298        85.66        .0479
   .632       13.776       103.24        .0445
   .684       15.261       119.89        .0424
   .737       16.869       132.52        .0424
   .790       18.644       147.34        .0422
   .842       20.586       164.39        .0417
   .895       22.695       183.72        .0412
   .947       24.971       205.41        .0405
  1.000       27.414       229.56        .0398
    ROUTE                 ID=14 HYD NO=105.2 INFLOW ID=13 DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD             ID=14 CODE=1

                                   PARTIAL HYDROGRAPH   105.20


        RUNOFF VOLUME =       .97974 INCHES     =      13.4550 ACRE-FEET
        PEAK DISCHARGE RATE =     364.47 CFS  AT   1.567 HOURS   BASIN AREA =   .2575 SQ. MI.


    *S AREA 106 IS FULLY DEVELOPED
    COMPUTE NM HYD       ID=15 HYD NO=106.00 AREA=0.02177 SQ MI
                         PER A=33 PER B=19 PER C=19 PER D=29
                         TP=-0.1333 HR   MASS RAIN=-1

        K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
        UNIT PEAK =   24.925    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
        AREA =      .006313 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


        K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
        UNIT PEAK =   36.067    CFS   UNIT VOLUME =    .9997       B =   311.05      P60 = 1.8700
        AREA =      .015457 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    PRINT HYD            ID=15   CODE=1
```

```
                                PARTIAL HYDROGRAPH   106.00

    RUNOFF VOLUME =      1.00753 INCHES      =        1.1698 ACRE-FEET
    PEAK DISCHARGE RATE =      35.84 CFS  AT   1.500 HOURS   BASIN AREA =   .0218 SQ. MI.


*S BASIN 300.1 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S A DENSITY OF 4 DU/AC
COMPUTE NM HYD       ID=16 HYD NO=300.1  AREA=0.0156 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   25.868    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .006552 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   24.074    CFS   UNIT VOLUME =    .9999       B =   354.67      P60 = 1.8700
    AREA =      .009048 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=16  CODE=1

                                HYDROGRAPH FROM AREA   300.10

    RUNOFF VOLUME =      1.29860 INCHES      =        1.0804 ACRE-FEET
    PEAK DISCHARGE RATE =      32.45 CFS  AT   1.500 HOURS   BASIN AREA =   .0156 SQ. MI.


*S **ADD THE FLOWS FROM BASINS 106 AND 300.1
ADD HYD              ID=17  HYD NO=106.1  ID=15  ID=16
PRINT HYD            ID=17  CODE=1

                                PARTIAL HYDROGRAPH   106.10

    RUNOFF VOLUME =      1.12902 INCHES      =        2.2502 ACRE-FEET
    PEAK DISCHARGE RATE =      68.29 CFS  AT   1.500 HOURS   BASIN AREA =   .0374 SQ. MI.


*S **TOTAL FLOW IN SAPHIRE ST AT ANALYSIS POINT A
ADD HYD              ID=18 HYD NO=106.15 ID=14 ID=17
PRINT HYD            ID=18 CODE=1

                                PARTIAL HYDROGRAPH   106.15
```

```
    RUNOFF VOLUME =       .99866 INCHES     =       15.7052 ACRE-FEET
    PEAK DISCHARGE RATE =     423.63 CFS  AT   1.567 HOURS   BASIN AREA =   .2949 SQ. MI.


*S  **BASIN 401.12, 401.14, 401.17, 300.2 AND 400.2 DRAINS TO SAPPHIRE ST.
*S  **BASIN 401.12 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD       ID=19 HYD NO=401.12 AREA=0.01126 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   18.671    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004729 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   17.376    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =      .006531 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=19  CODE=1

                                        HYDROGRAPH FROM AREA   401.12

    RUNOFF VOLUME =     1.29860 INCHES     =         .7798 ACRE-FEET
    PEAK DISCHARGE RATE =      23.43 CFS  AT   1.500 HOURS   BASIN AREA =   .0113 SQ. MI.


*S  **ADD THE FLOWS FROM HYDROGRAPH NO 401.12 AND 106.15
ADD HYD              ID=20 HYD NO=401.13 ID=19 ID=18
PRINT HYD            ID=20  CODE=1

                                        HYDROGRAPH FROM AREA   401.13


    RUNOFF VOLUME =     1.00969 INCHES     =      16.4850 ACRE-FEET
    PEAK DISCHARGE RATE =     443.65 CFS  AT   1.567 HOURS   BASIN AREA =   .3061 SQ. MI.


*S  **BASIN 300.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
*S  @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD       ID=1 HYD NO=300.2 AREA=0.0118 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   19.567    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004956 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    18.210    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =       .006844 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1  CODE=1

                                        HYDROGRAPH FROM AREA   300.20


    RUNOFF VOLUME =     1.29859 INCHES     =        .8172 ACRE-FEET
    PEAK DISCHARGE RATE =      24.55 CFS  AT   1.500 HOURS   BASIN AREA =   .0118 SQ. MI.


*S ** BASIN 401.14 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD       ID=4 HYD NO=401.14 AREA=0.01117 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    18.522    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =       .004691 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    17.237    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =       .006479 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=4 CODE=1

                                        HYDROGRAPH FROM AREA   401.14


    RUNOFF VOLUME =     1.29860 INCHES     =        .7736 ACRE-FEET
    PEAK DISCHARGE RATE =      23.24 CFS  AT   1.500 HOURS   BASIN AREA =   .0112 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 401.14 AND 300.2
ADD HYD              ID=5 HYD NO=401.15 ID=4 ID=1
PRINT HYD            ID=5 CODE=1

                                        HYDROGRAPH FROM AREA   401.15


    RUNOFF VOLUME =     1.29857 INCHES     =       1.5908 ACRE-FEET
    PEAK DISCHARGE RATE =      47.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0230 SQ. MI.
```

```
*S **ADD FLOWS FROM HYDROGRAPH NO 401.15 AND 401.13
ADD HYD              ID=6 HYD NO=401.16 ID=5 ID=20
PRINT HYD            ID=6 CODE=1

                                    HYDROGRAPH FROM AREA   401.16

    RUNOFF VOLUME =      1.02985 INCHES     =      18.0759 ACRE-FEET
    PEAK DISCHARGE RATE =     484.48 CFS  AT   1.567 HOURS   BASIN AREA =   .3291 SQ. MI.


*S **BASIN 401.17 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD       ID=7 HYD NO=401.17 AREA=0.00661 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.961    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .002776 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   10.201    CFS   UNIT VOLUME =    .9992       B =   354.67      P60 = 1.8700
    AREA =      .003834 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=7 CODE=1

                                    HYDROGRAPH FROM AREA   401.17

    RUNOFF VOLUME =      1.29860 INCHES     =        .4578 ACRE-FEET
    PEAK DISCHARGE RATE =      13.76 CFS  AT   1.500 HOURS   BASIN AREA =   .0066 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 401.16 AND 401.17
ADD HYD              ID=8 HYD NO=401.18 ID=6 ID=7
PRINT HYD            ID=8 CODE=1

                                    HYDROGRAPH FROM AREA   401.18

    RUNOFF VOLUME =      1.03514 INCHES     =      18.5337 ACRE-FEET
    PEAK DISCHARGE RATE =     496.23 CFS  AT   1.567 HOURS   BASIN AREA =   .3357 SQ. MI.


*S **BASINS 200,201, & 202 DRAIN TO KIMELA DR
COMPUTE NM HYD       ID=17 HYD NO=200.00 AREA=0.053 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1
```

```
K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   60.682    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
AREA =      .015370 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
UNIT PEAK =   87.807    CFS   UNIT VOLUME =    .9999       B =   311.05      P60 = 1.8700
AREA =      .037630 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=17   CODE=1

                                PARTIAL HYDROGRAPH   200.00


RUNOFF VOLUME =     1.00753 INCHES     =       2.8479 ACRE-FEET
PEAK DISCHARGE RATE =      87.23 CFS  AT   1.500 HOURS   BASIN AREA =   .0530 SQ. MI.


*S **ROUTE FLOW TO THE END OF KIMELA DR.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER       FLOW        FLOW        TOP
                                  SURFACE      AREA        RATE       WIDTH
                                   ELEV        SQ FT       CFS        FT
                                  100.00        .00         .00         .00
                                  100.05        .14         .15        5.26
                                  100.11        .55         .95       10.52
                                  100.16       1.25        2.80       15.78
                                  100.21       2.22        6.03       21.04
                                  100.26       3.46       10.94       26.30
                                  100.32       4.92       18.84       27.99
                                  100.37       6.39       29.08       28.01
                                  100.42       7.87       41.00       28.03
                                  100.47       9.34       54.46       28.04
                                  100.53      10.82       69.37       28.06
                                  100.58      12.30       85.66       28.07
                                  100.63      13.78      103.24       28.09
                                  100.68      15.26      119.89       28.96
                                  100.74      16.87      132.52       32.13
                                  100.79      18.64      147.34       35.31
                                  100.84      20.59      164.39       38.48
                                  100.89      22.69      183.72       41.66
                                  100.95      24.97      205.41       44.83
                                  101.00      27.41      229.56       48.00
COMPUTE TRAVEL TIME  ID=18 REACH NO=1 NO VS=1 L=800 FT SLP=0.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.2055
.105	.554	.95	.1295
.158	1.246	2.80	.0988
.211	2.215	6.03	.0816
.263	3.461	10.94	.0703
.316	4.920	18.84	.0580
.368	6.394	29.08	.0489
.421	7.869	41.00	.0427
.474	9.344	54.46	.0381
.526	10.821	69.37	.0347
.579	12.298	85.66	.0319
.632	13.776	103.24	.0297
.684	15.261	119.89	.0283
.737	16.869	132.52	.0283
.790	18.644	147.34	.0281
.842	20.586	164.39	.0278
.895	22.695	183.72	.0275
.947	24.971	205.41	.0270
1.000	27.414	229.56	.0265

```
ROUTE          ID=18 HYD NO=200.1 INFLOW ID=17 DT=0.0
PRINT HYD      ID=18 CODE=1

                    PARTIAL HYDROGRAPH   200.10

    RUNOFF VOLUME =     1.00753 INCHES     =       2.8479 ACRE-FEET
    PEAK DISCHARGE RATE =      86.94 CFS  AT   1.533 HOURS   BASIN AREA =   .0530 SQ. MI.


COMPUTE NM HYD      ID=1 HYD NO=201.00 AREA=0.026 SQ MI
                    PER A=33 PER B=19 PER C=19 PER D=29
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   29.768    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 = 1.8700
    AREA =      .007540 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   43.075    CFS   UNIT VOLUME =    .9997       B =   311.05      P60 = 1.8700
    AREA =      .018460 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1   CODE=1

                    PARTIAL HYDROGRAPH   201.00
```

```
    RUNOFF VOLUME =      1.00753 INCHES      =        1.3971 ACRE-FEET
    PEAK DISCHARGE RATE =       42.80 CFS  AT   1.500 HOURS   BASIN AREA =   .0260 SQ. MI.


ADD HYD              ID=18 HYD NO=201.1 ID=1 ID=18
PRINT HYD            ID=18 CODE=1

                                PARTIAL HYDROGRAPH   201.10


    RUNOFF VOLUME =      1.00752 INCHES      =        4.2450 ACRE-FEET
    PEAK DISCHARGE RATE =      128.91 CFS  AT   1.533 HOURS   BASIN AREA =   .0790 SQ. MI.


*S **BASIN 202 IS AN ELEMENTARY SCHOOL,(ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD       ID=19 HYD NO=202.00 AREA=0.009253 SQ MI
                     PER A=100 PER B=0 PER C=0 PER D=0
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .163684HR    TP =   .133300HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   18.988    CFS   UNIT VOLUME =    .9989       B =   273.54      P60 = 1.8700
    AREA =      .009253 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=19   CODE=1

                                PARTIAL HYDROGRAPH   202.00


    RUNOFF VOLUME =       .43925 INCHES      =         .2168 ACRE-FEET
    PEAK DISCHARGE RATE =        7.69 CFS  AT   1.533 HOURS   BASIN AREA =   .0093 SQ. MI.


*S **BASIN 202.05 IS THE ELEMENTARY SCHOOL PARKING LOT THAT WILL DRAIN TO KIMELA
COMPUTE NM HYD       ID=1  HYD NO=202.05 AREA=0.003747 SQ MI
                     PER A=0  PER B=0  PER C=0  PER D=100
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   14.793    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 = 1.8700
    AREA =      .003747 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1  CODE=1

                                PARTIAL HYDROGRAPH   202.05


    RUNOFF VOLUME =      1.96548 INCHES      =         .3928 ACRE-FEET
    PEAK DISCHARGE RATE =       10.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0037 SQ. MI.
```

```
*S **ADD THE BASINS OF THE ELEMENTARY SCHOOL AND PARKING LOT
ADD HYD              ID=2  HYD NO=202.06 ID I=19  ID II=1
PRINT HYD            ID=2  CODE=1

                                PARTIAL HYDROGRAPH   202.06

    RUNOFF VOLUME =       .87913 INCHES     =        .6095 ACRE-FEET
    PEAK DISCHARGE RATE =      18.01 CFS  AT   1.500 HOURS   BASIN AREA =   .0130 SQ. MI.


*S **ADD THE BASINS TOGETHER TO GET THE FLOW IN KIMELA DR @ ANALYSIS PT B
ADD HYD              ID=20 HYD NO=202.1 ID=18 ID=2
PRINT HYD            ID=20 CODE=1

                                PARTIAL HYDROGRAPH   202.10

    RUNOFF VOLUME =       .98938 INCHES     =       4.8545 ACRE-FEET
    PEAK DISCHARGE RATE =     146.56 CFS  AT   1.533 HOURS   BASIN AREA =   .0920 SQ. MI.


*S DIVIDE HYDROGRAPH FOR STREET FLOW & SD FLOW
DIVIDE HYD           ID=20 Q=72  ID I=11  HYD I=202.2
                                 ID II=12 HYD II=202.3
*S **ROUTE 72 CFS IN EXTENDED KIMELA DR TO THE PROPOSED UNSER RD
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31

100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME  ID=13 REACH NO=1 NO VS=1 L=980 FT SLP=0.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.2518
.105	.554	.95	.1586
.158	1.246	2.80	.1210
.211	2.215	6.03	.0999
.263	3.461	10.94	.0861
.316	4.920	18.84	.0711
.368	6.394	29.08	.0599
.421	7.869	41.00	.0522
.474	9.344	54.46	.0467
.526	10.821	69.37	.0425
.579	12.298	85.66	.0391
.632	13.776	103.24	.0363
.684	15.261	119.89	.0346
.737	16.869	132.52	.0347
.790	18.644	147.34	.0344
.842	20.586	164.39	.0341
.895	22.695	183.72	.0336
.947	24.971	205.41	.0331
1.000	27.414	229.56	.0325

```
ROUTE                ID=13 HYD NO=202.4 INFLOW ID=11 DT=0.0
PRINT HYD            ID=13 CODE=1
```

PARTIAL HYDROGRAPH 202.40

RUNOFF VOLUME = .98939 INCHES = 3.8839 ACRE-FEET
PEAK DISCHARGE RATE = 72.25 CFS AT 1.533 HOURS BASIN AREA = .0736 SQ. MI.

```
*S **ROUTE REMANING FLOW IN 48" SD TO UNSER
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLOPE=0.020
                     DIA=4.0 FT N=0.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.21	.25	1.07	1.78
.42	.69	4.63	2.44
.63	1.25	10.75	2.91

.83	1.90	19.34	3.25
1.04	2.60	30.20	3.51
1.25	3.36	43.09	3.71
1.46	4.15	57.73	3.85
1.67	4.96	73.80	3.94
1.88	5.79	90.98	3.99
2.08	6.62	108.89	4.00
2.29	7.45	127.12	4.00
2.50	8.27	145.25	4.00
2.71	9.06	162.80	4.00
2.92	9.82	179.23	4.00
3.13	10.54	193.93	4.00
3.34	11.20	206.17	4.00
3.54	11.77	214.92	4.00
3.75	12.24	218.52	4.00
4.00	12.57	218.52	4.00

COMPUTE TRAVEL TIME ID=14 REACH NO=1 NO VS=1 L=980 FT SLP=0.02

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	1.07	.0638
.417	.695	4.63	.0409
.625	1.255	10.75	.0318
.834	1.898	19.34	.0267
1.042	2.604	30.20	.0235
1.251	3.358	43.09	.0212
1.459	4.146	57.73	.0196
1.668	4.960	73.80	.0183
1.876	5.788	90.98	.0173
2.084	6.621	108.89	.0166
2.293	7.451	127.12	.0160
2.501	8.267	145.25	.0155
2.710	9.062	162.80	.0152
2.918	9.823	179.23	.0149
3.127	10.539	193.93	.0148
3.335	11.195	206.17	.0148
3.544	11.773	214.92	.0149
3.752	12.243	218.52	.0153
4.000	12.566	218.52	.0157

ROUTE ID=14 HYD NO=202.5 INFLOW ID=12 DT=0.0

PROBLEM FAILED TO CONVERGE AFTER 50 ITERATIONS. CONVERGENCE WAS FORCED. OUTFLOW NUMBER = 600 RATE = .00

PRINT HYD ID=14 CODE=1

PARTIAL HYDROGRAPH 202.50

RUNOFF VOLUME = .98966 INCHES = .9709 ACRE-FEET

PEAK DISCHARGE RATE = 75.85 CFS AT 1.533 HOURS BASIN AREA = .0184 SQ. MI.

```
*S **ADD THE FLOWS BACK TOGETHER FOR A TOTAL Q
ADD HYD              ID=15 HYD NO=202.6 ID=13 ID=14
PRINT HYD            ID=15 CODE=1

                                PARTIAL HYDROGRAPH   202.60

    RUNOFF VOLUME =       .98943 INCHES     =       4.8548 ACRE-FEET
    PEAK DISCHARGE RATE =     148.10 CFS  AT   1.533 HOURS   BASIN AREA =   .0920 SQ. MI.


*S **BASINS 400 THRU 407 ARE CURRENTLY UNDEVELOPED, FOR PURPOSES
*S OF THIS REPORT, ASSUME ALL BASINS WILL BE BUILT OUT @ THEIR CURRENT
*S ZONING
COMPUTE NM HYD       ID=16 HYD NO=400.1 AREA=0.0314 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   52.067    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .013188 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   48.456    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =      .018212 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=16   CODE=1

                                HYDROGRAPH FROM AREA   400.10

    RUNOFF VOLUME =     1.29860 INCHES     =       2.1747 ACRE-FEET
    PEAK DISCHARGE RATE =      65.30 CFS  AT   1.500 HOURS   BASIN AREA =   .0314 SQ. MI.


*S **COMPUTE BASIN 400.2
COMPUTE NM HYD       ID=17 HYD NO=400.2 AREA=0.0326 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   54.057    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .013692 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   50.308    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =       .018908 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=17 CODE=1

                                        HYDROGRAPH FROM AREA   400.20


    RUNOFF VOLUME =     1.29860 INCHES     =       2.2578 ACRE-FEET
    PEAK DISCHARGE RATE =      67.80 CFS  AT   1.500 HOURS   BASIN AREA =   .0326 SQ. MI.


*S **BASIN 402 IS UNIT 2 OF SUNRISE ESTATES
COMPUTE NM HYD      ID=5 HYD NO=402.00 AREA=0.052 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   86.225    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =       .021840 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   80.246    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =       .030160 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=5   CODE=1

                                        HYDROGRAPH FROM AREA   402.00


    RUNOFF VOLUME =     1.29860 INCHES     =       3.6014 ACRE-FEET
    PEAK DISCHARGE RATE =     108.14 CFS  AT   1.500 HOURS   BASIN AREA =   .0520 SQ. MI.


*S **ADD BASIN 402 TO THE TOTAL FLOW @ THE END OF EXTENDED KIMELA
ADD HYD             ID=6 HYD NO=402.1 ID=5 ID=15
PRINT HYD           ID=6 CODE=1

                                        HYDROGRAPH FROM AREA   402.10


    RUNOFF VOLUME =     1.10107 INCHES     =       8.4562 ACRE-FEET
    PEAK DISCHARGE RATE =     252.75 CFS  AT   1.533 HOURS   BASIN AREA =   .1440 SQ. MI.
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*S **ASSUME BASINS 403 THRU 407 WILL DEVELOP @ 4 DU/AC
COMPUTE NM HYD       ID=7 HYD NO=403.00 AREA=0.0148 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   24.541    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .006216 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   22.839    CFS   UNIT VOLUME =    .9999       B =   354.67      P60 = 1.8700
    AREA =      .008584 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=7   CODE=1

                                        HYDROGRAPH FROM AREA   403.00


    RUNOFF VOLUME =     1.29860 INCHES     =       1.0250 ACRE-FEET
    PEAK DISCHARGE RATE =      30.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0148 SQ. MI.


*S **ADD FLOW TO THAT IN SAPPHIRE ST
ADD HYD              ID=8 HYD NO=403.1 ID=8 ID=7
PRINT HYD            ID=8 CODE=1

                                        HYDROGRAPH FROM AREA   403.10


    RUNOFF VOLUME =     1.04627 INCHES     =      19.5587 ACRE-FEET
    PEAK DISCHARGE RATE =     522.54 CFS  AT   1.567 HOURS   BASIN AREA =   .3505 SQ. MI.


COMPUTE NM HYD       ID=9 HYD NO=404.00 AREA=0.0108 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   17.908    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004536 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   16.666    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =      .006264 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=9   CODE=1
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                                        HYDROGRAPH FROM AREA   404.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .7480 ACRE-FEET
    PEAK DISCHARGE RATE =      22.47 CFS  AT   1.500 HOURS   BASIN AREA =   .0108 SQ. MI.


*S **ADD FLOW TO THAT IN KIMELA DR
ADD HYD              ID=10 HYD NO=404.1 ID=6 ID=9
PRINT HYD            ID=10 CODE=1

                                        HYDROGRAPH FROM AREA   404.10

    RUNOFF VOLUME =      1.11485 INCHES      =        9.2042 ACRE-FEET
    PEAK DISCHARGE RATE =     274.50 CFS  AT   1.533 HOURS   BASIN AREA =   .1548 SQ. MI.


*S **BASIN 405 DRAINS TO THE SOUTH
COMPUTE NM HYD       ID=11 HYD NO=405.00 AREA=0.0141 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   23.380    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .005922 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   21.759    CFS   UNIT VOLUME =    .9999       B =   354.67      P60 = 1.8700
    AREA =      .008178 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=11   CODE=1

                                        HYDROGRAPH FROM AREA   405.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .9765 ACRE-FEET
    PEAK DISCHARGE RATE =      29.33 CFS  AT   1.500 HOURS   BASIN AREA =   .0141 SQ. MI.


*S **ADD TO FLOW IN SAPPHIRE
ADD HYD              ID=12 HYD NO=405.1 ID=8 ID=11
PRINT HYD            ID=12 CODE=1

                                        HYDROGRAPH FROM AREA   405.10
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RUNOFF VOLUME = 1.05602 INCHES = 20.5352 ACRE-FEET
PEAK DISCHARGE RATE = 547.59 CFS AT 1.567 HOURS BASIN AREA = .3646 SQ. MI.

*S ROUTE FLOW IN KIMELA UP TO TOTAL FLOW @ SAPPHIRE & ARENAL
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLOPE=0.008
DIA=5.5 FT N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.29	.47	1.58	2.44
.57	1.31	6.84	3.36
.86	2.37	15.90	3.99
1.15	3.59	28.60	4.47
1.43	4.92	44.65	4.83
1.72	6.35	63.71	5.10
2.01	7.84	85.35	5.30
2.29	9.38	109.12	5.42
2.58	10.94	134.52	5.49
2.87	12.52	161.00	5.50
3.15	14.09	187.96	5.50
3.44	15.63	214.76	5.50
3.73	17.13	240.70	5.50
4.01	18.57	265.00	5.50
4.30	19.92	286.74	5.50
4.59	21.17	304.83	5.50
4.87	22.26	317.78	5.50
5.16	23.15	323.10	5.50
5.50	23.76	323.10	5.50

COMPUTE TRAVEL TIME ID=2 REACH NO=1 NO VS=1 L=1150 FT SLP=0.004

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.287	.472	1.58	.0958
.573	1.314	6.84	.0614
.860	2.373	15.90	.0477
1.146	3.589	28.60	.0401
1.433	4.923	44.65	.0352
1.720	6.348	63.71	.0318
2.006	7.839	85.35	.0293
2.293	9.377	109.12	.0274
2.579	10.942	134.52	.0260
2.866	12.518	161.00	.0248
3.153	14.086	187.96	.0239
3.439	15.630	214.76	.0232
3.726	17.132	240.70	.0227

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                                4.013      18.571      265.00       .0224
                                4.299      19.925      286.74       .0222
                                4.586      21.166      304.83       .0222
                                4.872      22.258      317.78       .0224
                                5.159      23.147      323.10       .0229
                                5.500      23.758      323.10       .0235
ROUTE                  ID=2 HYD NO=404.3 INFLOW ID=10 DT=0.0
PRINT HYD              ID=2 CODE=1

                                        HYDROGRAPH FROM AREA   404.30

    RUNOFF VOLUME =      1.11485 INCHES      =       9.2042 ACRE-FEET
    PEAK DISCHARGE RATE =     266.36 CFS  AT   1.533 HOURS   BASIN AREA =   .1548 SQ. MI.


*S **ADD FLOWS FROM BASIN 400.2 AND THE FLOWS ABOVE
ADD HYD                ID=6 HYD NO=400.21 ID=17 ID=2
PRINT HYD              ID=6 CODE=1

                                        HYDROGRAPH FROM AREA   400.21

    RUNOFF VOLUME =      1.14681 INCHES      =      11.4620 ACRE-FEET
    PEAK DISCHARGE RATE =     331.97 CFS  AT   1.533 HOURS   BASIN AREA =   .1874 SQ. MI.


*S **ADD THE FLOWS BACK TOGETHER FOR A TOTAL Q
ADD HYD                ID=3 HYD NO=405.3 ID=6 ID=12
PRINT HYD              ID=3 CODE=1

                                        HYDROGRAPH FROM AREA   405.30

    RUNOFF VOLUME =      1.08685 INCHES      =      31.9971 ACRE-FEET
    PEAK DISCHARGE RATE =     873.78 CFS  AT   1.533 HOURS   BASIN AREA =   .5520 SQ. MI.


*S DESIGN A RETENTION FACILITY TO REDUCE TO FLOW TO THAT WHICH WILL
*S FIT IN A 66" RCP @ S=1.8%
ROUTE RESERVOIR        ID=4 HYD NO=405.4 INFLOW ID=3 CODE=1
                       OUTFLOW(CFS)  STORAGE(AF)  ELEV(FT)
                            0             0          0
                           34            2.5         1
                          134            5.0         2
                          274            7.5         3
                          417           10.0         4
                          446           12.5         5
                          495           14.25       5.5

  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
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TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	.00	.000	.00
.03	.00	.00	.000	.00
.07	.00	.00	.000	.00
.10	.00	.00	.000	.00
.13	.00	.00	.000	.00
.17	.00	.00	.000	.00
.20	.00	.00	.000	.00
.23	.00	.00	.000	.00
.27	.00	.00	.000	.00
.30	.00	.00	.000	.00
.33	.00	.00	.000	.00
.37	.00	.00	.000	.00
.40	.00	.00	.000	.00
.43	.00	.00	.000	.00
.47	.00	.00	.000	.00
.50	.00	.00	.000	.00
.53	.00	.00	.000	.00
.57	.00	.00	.000	.00
.60	.00	.00	.000	.00
.63	.00	.00	.000	.00
.67	.00	.00	.000	.00
.70	.00	.00	.000	.00
.73	.00	.00	.000	.00
.77	.00	.00	.000	.00
.80	.00	.00	.000	.00
.83	.00	.00	.000	.00
.87	.00	.00	.000	.00
.90	.00	.00	.000	.00
.93	.00	.00	.000	.00
.97	.00	.00	.000	.00
1.00	.00	.00	.000	.00
1.03	.00	.00	.000	.00
1.07	.00	.00	.000	.00
1.10	.00	.00	.000	.00
1.13	.02	.00	.000	.00
1.17	.47	.00	.001	.01
1.20	3.15	.00	.006	.08
1.23	10.41	.01	.024	.32
1.27	23.92	.03	.069	.94
1.30	46.85	.06	.162	2.21
1.33	87.20	.14	.338	4.59
1.37	159.86	.26	.659	8.97
1.40	282.25	.49	1.233	16.76
1.43	455.17	.87	2.184	29.71
1.47	633.95	1.42	3.539	75.57
1.50	791.64	2.08	5.199	145.13
1.53	873.78	2.78	6.957	243.60
1.57	866.73	3.42	8.558	334.52
1.60	804.94	3.94	9.838	407.74
1.63	721.67	4.32	10.792	426.19
1.67	633.75	4.59	11.474	434.10

1.70	561.52	4.77	11.917	439.24
1.73	479.62	4.86	12.138	441.80
1.77	412.06	4.86	12.149	441.93
1.80	357.83	4.80	11.994	440.14
1.83	314.02	4.68	11.712	436.86

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
1.87	277.39	4.53	11.329	432.42
1.90	246.40	4.35	10.867	427.06
1.93	221.35	4.14	10.343	420.98
1.97	201.28	3.92	9.788	404.86
2.00	184.91	3.70	9.247	373.93
2.03	171.12	3.50	8.747	345.32
2.07	157.35	3.31	8.284	318.87
2.10	141.15	3.14	7.851	294.09
2.13	123.10	2.98	7.438	270.51
2.17	105.66	2.82	7.038	248.15
2.20	90.60	2.66	6.655	226.66
2.23	78.29	2.52	6.291	206.30
2.27	68.58	2.38	5.951	187.27
2.30	60.95	2.26	5.638	169.73
2.33	54.80	2.14	5.352	153.71
2.37	49.58	2.04	5.092	139.17
2.40	45.02	1.94	4.854	128.18
2.43	41.09	1.85	4.632	119.29
2.47	37.66	1.77	4.424	110.94
2.50	34.61	1.69	4.228	103.13
2.53	31.91	1.62	4.046	95.83
2.57	29.51	1.55	3.876	89.03
2.60	27.34	1.49	3.718	82.70
2.63	25.34	1.43	3.570	76.82
2.67	23.48	1.37	3.434	71.35
2.70	21.74	1.32	3.306	66.26
2.73	20.12	1.28	3.188	61.52
2.77	18.67	1.23	3.078	57.12
2.80	17.40	1.19	2.976	53.04
2.83	16.25	1.15	2.881	49.26
2.87	15.20	1.12	2.794	45.76
2.90	14.21	1.09	2.713	42.51
2.93	13.30	1.06	2.638	39.51
2.97	12.47	1.03	2.568	36.73
3.00	11.71	1.00	2.504	34.16
3.03	11.01	.98	2.442	33.22
3.07	10.38	.95	2.382	32.39
3.10	9.80	.93	2.321	31.57
3.13	9.26	.90	2.262	30.76
3.17	8.76	.88	2.203	29.96
3.20	8.30	.86	2.145	29.17
3.23	7.88	.84	2.088	28.40
3.27	7.49	.81	2.032	27.63
3.30	7.13	.79	1.977	26.89
3.33	6.79	.77	1.923	26.15

3.37	6.48	.75	1.870	25.44
3.40	6.19	.73	1.819	24.73
3.43	5.93	.71	1.768	24.05
3.47	5.68	.69	1.719	23.38
3.50	5.45	.67	1.671	22.72
3.53	5.24	.65	1.624	22.08
3.57	5.05	.63	1.578	21.46
3.60	4.87	.61	1.533	20.85
3.63	4.71	.60	1.490	20.26
3.67	4.57	.58	1.448	19.69
3.70	4.43	.56	1.407	19.13

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
3.73	4.30	.55	1.367	18.59
3.77	4.17	.53	1.328	18.06
3.80	4.06	.52	1.290	17.55
3.83	3.96	.50	1.254	17.05
3.87	3.87	.49	1.218	16.56
3.90	3.79	.47	1.184	16.10
3.93	3.71	.46	1.150	15.64
3.97	3.63	.45	1.118	15.20
4.00	3.56	.43	1.086	14.78
4.03	3.50	.42	1.056	14.36
4.07	3.44	.41	1.027	13.96
4.10	3.39	.40	.998	13.57
4.13	3.35	.39	.970	13.20
4.17	3.31	.38	.944	12.83
4.20	3.26	.37	.918	12.48
4.23	3.21	.36	.893	12.14
4.27	3.17	.35	.869	11.81
4.30	3.13	.34	.845	11.50
4.33	3.11	.33	.823	11.19
4.37	3.08	.32	.801	10.89
4.40	3.05	.31	.780	10.60
4.43	3.03	.30	.759	10.32
4.47	3.01	.30	.739	10.06
4.50	2.99	.29	.720	9.80
4.53	2.97	.28	.702	9.55
4.57	2.95	.27	.684	9.30
4.60	2.94	.27	.667	9.07
4.63	2.93	.26	.650	8.84
4.67	2.92	.25	.634	8.63
4.70	2.91	.25	.619	8.42
4.73	2.91	.24	.604	8.21
4.77	2.91	.24	.590	8.02
4.80	2.91	.23	.576	7.83
4.83	2.91	.23	.563	7.65
4.87	2.91	.22	.550	7.48
4.90	2.90	.21	.537	7.31
4.93	2.90	.21	.525	7.15
4.97	2.91	.21	.514	6.99
5.00	2.91	.20	.503	6.84

5.03	2.92	.20	.492	6.70
5.07	2.93	.19	.482	6.56
5.10	2.95	.19	.472	6.42
5.13	2.97	.19	.463	6.30
5.17	2.98	.18	.454	6.17
5.20	2.98	.18	.445	6.06
5.23	2.99	.17	.437	5.94
5.27	3.01	.17	.429	5.84
5.30	3.03	.17	.422	5.73
5.33	3.05	.17	.414	5.63
5.37	3.07	.16	.407	5.54
5.40	3.08	.16	.401	5.45
5.43	3.09	.16	.394	5.36
5.47	3.10	.16	.388	5.28
5.50	3.12	.15	.382	5.20
5.53	3.16	.15	.377	5.12
5.57	3.18	.15	.371	5.05

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
5.60	3.19	.15	.366	4.98
5.63	3.21	.14	.362	4.92
5.67	3.23	.14	.357	4.85
5.70	3.26	.14	.353	4.80
5.73	3.28	.14	.348	4.74
5.77	3.30	.14	.345	4.69
5.80	3.32	.14	.341	4.64
5.83	3.35	.13	.337	4.59
5.87	3.37	.13	.334	4.54
5.90	3.40	.13	.331	4.50
5.93	3.43	.13	.328	4.46
5.97	3.46	.13	.325	4.42
6.00	3.48	.13	.323	4.39
6.03	3.50	.13	.320	4.35
6.07	3.44	.13	.318	4.32
6.10	3.23	.13	.315	4.29
6.13	2.91	.12	.312	4.24
6.17	2.56	.12	.308	4.19
6.20	2.22	.12	.303	4.12
6.23	1.95	.12	.297	4.04
6.27	1.72	.12	.291	3.96
6.30	1.53	.11	.285	3.88
6.33	1.38	.11	.279	3.79
6.37	1.25	.11	.272	3.70
6.40	1.13	.11	.265	3.61
6.43	1.03	.10	.258	3.51
6.47	.94	.10	.251	3.42
6.50	.86	.10	.245	3.33
6.53	.79	.10	.238	3.23
6.57	.72	.09	.231	3.14
6.60	.66	.09	.224	3.05
6.63	.60	.09	.218	2.96
6.67	.55	.08	.211	2.88

6.70	.51	.08	.205	2.79
6.73	.46	.08	.199	2.71
6.77	.43	.08	.193	2.62
6.80	.39	.07	.187	2.54
6.83	.36	.07	.181	2.46
6.87	.32	.07	.175	2.38
6.90	.30	.07	.170	2.31
6.93	.27	.07	.164	2.23
6.97	.24	.06	.159	2.16
7.00	.22	.06	.154	2.09
7.03	.20	.06	.149	2.02
7.07	.19	.06	.144	1.95
7.10	.17	.06	.139	1.89
7.13	.15	.05	.134	1.82
7.17	.14	.05	.130	1.76
7.20	.13	.05	.125	1.70
7.23	.12	.05	.121	1.64
7.27	.11	.05	.117	1.59
7.30	.10	.05	.113	1.53
7.33	.09	.04	.109	1.48
7.37	.08	.04	.105	1.43
7.40	.07	.04	.101	1.38
7.43	.06	.04	.098	1.33

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
7.47	.06	.04	.094	1.28
7.50	.05	.04	.091	1.24
7.53	.05	.04	.088	1.20
7.57	.04	.03	.085	1.15
7.60	.04	.03	.082	1.11
7.63	.04	.03	.079	1.07
7.67	.03	.03	.076	1.03
7.70	.03	.03	.073	1.00
7.73	.03	.03	.071	.96
7.77	.02	.03	.068	.93
7.80	.02	.03	.066	.89
7.83	.02	.03	.063	.86
7.87	.02	.02	.061	.83
7.90	.02	.02	.059	.80
7.93	.01	.02	.057	.77
7.97	.01	.02	.055	.74
8.00	.01	.02	.053	.72
8.03	.01	.02	.051	.69
8.07	.01	.02	.049	.67
8.10	.01	.02	.047	.64
8.13	.01	.02	.046	.62
8.17	.01	.02	.044.	.60
8.20	.01	.02	.042	.57
8.23	.01	.02	.041	.55
8.27	.01	.02	.039	.53
8.30	.00	.02	.038	.51
8.33	.00	.01	.036	.50

8.37	.00	.01	.035	.48
8.40	.00	.01	.034	.46
8.43	.00	.01	.033	.44
8.47	.00	.01	.031	.43
8.50	.00	.01	.030	.41
8.53	.00	.01	.029	.40
8.57	.00	.01	.028	.38
8.60	.00	.01	.027	.37
8.63	.00	.01	.026	.35
8.67	.00	.01	.025	.34
8.70	.00	.01	.024	.33
8.73	.00	.01	.023	.32
8.77	.00	.01	.022	.31
8.80	.00	.01	.022	.29
8.83	.00	.01	.021	.28
8.87	.00	.01	.020	.27
8.90	.00	.01	.019	.26
8.93	.00	.01	.019	.25
8.97	.00	.01	.018	.24
9.00	.00	.01	.017	.23
9.03	.00	.01	.017	.23
9.07	.00	.01	.016	.22
9.10	.00	.01	.015	.21
9.13	.00	.01	.015	.20
9.17	.00	.01	.014	.19
9.20	.00	.01	.014	.19
9.23	.00	.01	.013	.18
9.27	.00	.01	.013	.17
9.30	.00	.00	.012	.17

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
9.33	.00	.00	.012	.16
9.37	.00	.00	.011	.16
9.40	.00	.00	.011	.15
9.43	.00	.00	.011	.14
9.47	.00	.00	.010	.14
9.50	.00	.00	.010	.13
9.53	.00	.00	.009	.13
9.57	.00	.00	.009	.12
9.60	.00	.00	.009	.12
9.63	.00	.00	.008	.12
9.67	.00	.00	.008	.11
9.70	.00	.00	.008	.11
9.73	.00	.00	.008	.10
9.77	.00	.00	.007	.10
9.80	.00	.00	.007	.10
9.83	.00	.00	.007	.09
9.87	.00	.00	.007	.09
9.90	.00	.00	.006	.09
9.93	.00	.00	.006	.08
9.97	.00	.00	.006	.08
10.00	.00	.00	.006	.08

10.03	.00	.00	.005	.07
10.07	.00	.00	.005	.07
10.10	.00	.00	.005	.07
10.13	.00	.00	.005	.07
10.17	.00	.00	.005	.06
10.20	.00	.00	.004	.06
10.23	.00	.00	.004	.06
10.27	.00	.00	.004	.06
10.30	.00	.00	.004	.05
10.33	.00	.00	.004	.05
10.37	.00	.00	.004	.05
10.40	.00	.00	.004	.05
10.43	.00	.00	.003	.05
10.47	.00	.00	.003	.05
10.50	.00	.00	.003	.04
10.53	.00	.00	.003	.04
10.57	.00	.00	.003	.04
10.60	.00	.00	.003	.04
10.63	.00	.00	.003	.04
10.67	.00	.00	.003	.04
10.70	.00	.00	.003	.03
10.73	.00	.00	.002	.03
10.77	.00	.00	.002	.03
10.80	.00	.00	.002	.03
10.83	.00	.00	.002	.03
10.87	.00	.00	.002	.03
10.90	.00	.00	.002	.03
10.93	.00	.00	.002	.03
10.97	.00	.00	.002	.03
11.00	.00	.00	.002	.02
11.03	.00	.00	.002	.02
11.07	.00	.00	.002	.02
11.10	.00	.00	.002	.02
11.13	.00	.00	.002	.02
11.17	.00	.00	.002	.02

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
11.20	.00	.00	.001	.02
11.23	.00	.00	.001	.02
11.27	.00	.00	.001	.02
11.30	.00	.00	.001	.02
11.33	.00	.00	.001	.02
11.37	.00	.00	.001	.02
11.40	.00	.00	.001	.02
11.43	.00	.00	.001	.02
11.47	.00	.00	.001	.01
11.50	.00	.00	.001	.01
11.53	.00	.00	.001	.01
11.57	.00	.00	.001	.01
11.60	.00	.00	.001	.01
11.63	.00	.00	.001	.01
11.67	.00	.00	.001	.01

11.70	.00	.00	.001	.01
11.73	.00	.00	.001	.01
11.77	.00	.00	.001	.01
11.80	.00	.00	.001	.01
11.83	.00	.00	.001	.01
11.87	.00	.00	.001	.01
11.90	.00	.00	.001	.01
11.93	.00	.00	.001	.01
11.97	.00	.00	.001	.01
12.00	.00	.00	.001	.01
12.03	.00	.00	.001	.01
12.07	.00	.00	.001	.01
12.10	.00	.00	.001	.01
12.13	.00	.00	.001	.01
12.17	.00	.00	.000	.01
12.20	.00	.00	.000	.01
12.23	.00	.00	.000	.01
12.27	.00	.00	.000	.01
12.30	.00	.00	.000	.01
12.33	.00	.00	.000	.01
12.37	.00	.00	.000	.01
12.40	.00	.00	.000	.01
12.43	.00	.00	.000	.00

PEAK DISCHARGE = 441.927 CFS - PEAK OCCURS AT HOUR 1.77
MAXIMUM WATER SURFACE ELEVATION = 4.860
MAXIMUM STORAGE = 12.1489 AC-FT INCREMENTAL TIME= .033330HRS

*S ROUTE FLOW FROM THE DETENTION POND TO THE AMOLE DEL NORTE CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLOPE=0.020
DIA=5.5 FT N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.29	.47	2.49	2.44
.57	1.31	10.81	3.36
.86	2.37	25.14	3.99
1.15	3.59	45.21	4.47
1.43	4.92	70.60	4.83
1.72	6.35	100.73	5.10
2.01	7.84	134.95	5.30
2.29	9.38	172.54	5.42
2.58	10.94	212.70	5.49
2.87	12.52	254.56	5.50
3.15	14.09	297.19	5.50
3.44	15.63	339.56	5.50
3.73	17.13	380.58	5.50
4.01	18.57	419.00	5.50
4.30	19.92	453.38	5.50
4.59	21.17	481.98	5.50
4.87	22.26	502.45	5.50
5.16	23.15	510.86	5.50

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                                        5.50        23.76       510.86        5.50
COMPUTE TRAVEL TIME  ID=5 REACH NO=1 NO VS=1 L=1150 FT SLP=0.020

                          TRAVEL TIME TABLE
                                      REACH=  1.0

                          WATER       AVERAGE     FLOW        TRAVEL
                          DEPTH       AREA        RATE        TIME
                          FEET        SQ.FT.      CFS         HRS
                             .287        .472        2.49       .0606
                             .573       1.314       10.81       .0388
                             .860       2.373       25.14       .0301
                            1.146       3.589       45.21       .0254
                            1.433       4.923       70.60       .0223
                            1.720       6.348      100.73       .0201
                            2.006       7.839      134.95       .0186
                            2.293       9.377      172.54       .0174
                            2.579      10.942      212.70       .0164
                            2.866      12.518      254.56       .0157
                            3.153      14.086      297.19       .0151
                            3.439      15.630      339.56       .0147
                            3.726      17.132      380.58       .0144
                            4.013      18.571      419.00       .0142
                            4.299      19.925      453.38       .0140
                            4.586      21.166      481.98       .0140
                            4.872      22.258      502.45       .0142
                            5.159      23.147      510.86       .0145
                            5.500      23.758      510.86       .0149
ROUTE                 ID=5 HYD NO=405.3 INFLOW ID=4 DT=0.0
PRINT HYD             ID=5 CODE=1

                                        HYDROGRAPH FROM AREA   405.30


    RUNOFF VOLUME =      1.08684 INCHES      =      31.9971 ACRE-FEET
    PEAK DISCHARGE RATE =      442.00 CFS  AT   1.766 HOURS   BASIN AREA =   .5520 SQ. MI.


*S **CALC BASIN 406 (WEST PORTION OF VALLEY SOUTH)
COMPUTE NM HYD        ID=13 HYD NO=406.00 AREA=0.0565 SQ MI
                      PER A=0 PER B=29 PER C=29 PER D=42
                      TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   93.687    CFS   UNIT VOLUME =    .9993       B =   526.28      P60 = 1.8700
    AREA =      .023730 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   87.190    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =      .032770 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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PRINT HYD            ID=13   CODE=1

                                        HYDROGRAPH FROM AREA   406.00

    RUNOFF VOLUME =     1.29860 INCHES     =       3.9131 ACRE-FEET
    PEAK DISCHARGE RATE =     117.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0565 SQ. MI.


*S **CALC BASIN 407
COMPUTE NM HYD       ID=16 HYD NO=407.00 AREA=0.0504 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   83.572    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .021168 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   77.777    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =      .029232 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=16   CODE=1

                                        HYDROGRAPH FROM AREA   407.00

    RUNOFF VOLUME =     1.29860 INCHES     =       3.4906 ACRE-FEET
    PEAK DISCHARGE RATE =     104.81 CFS  AT   1.500 HOURS   BASIN AREA =   .0504 SQ. MI.


*S **COMBINE BASINS 406 AND 407 TOGETHER
ADD HYD              ID=14  HYD NO=406.1  ID=13  ID=16
PRINT HYD            ID=14  CODE=1

                                        HYDROGRAPH FROM AREA   406.10

    RUNOFF VOLUME =     1.29859 INCHES     =       7.4037 ACRE-FEET
    PEAK DISCHARGE RATE =     222.30 CFS  AT   1.500 HOURS   BASIN AREA =   .1069 SQ. MI.


*S ROUTE FLOW FROM BASINS 406 AND 407 TO AMOLE DEL NORTE CHANNEL
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEG=1  MIN EL=100.0  MAX EL=102.0
                     CH SLOPE=0.0143  FP SLOPE=0.0133  N=0.032  DIST=540
                     DIST   EL    DIST   EL    DIST   EL    DIST   EL
                      0    102.0   92   101.0   186  100.0   308  100.0
                      540  101.0
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RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.11	14.65	16.18	156.32
100.21	32.91	54.64	190.63
100.32	54.78	114.41	224.95
100.42	80.27	196.72	259.26
100.53	109.36	303.22	293.58
100.63	142.07	435.66	327.89
100.74	178.39	595.81	362.21
100.84	218.33	785.45	396.53
100.95	261.87	1006.29	430.84
101.05	308.70	1280.55	452.84
101.16	356.88	1607.82	462.53
101.26	406.08	1966.59	472.21
101.37	456.29	2356.29	481.89
101.47	507.53	2776.48	491.58
101.58	559.78	3226.85	501.26
101.68	613.06	3707.15	510.95
101.79	667.35	4217.21	520.63
101.89	722.66	4756.92	530.32
102.00	779.00	5326.21	540.00

COMPUTE TRAVEL TIME ID=15 REACH NO=1 NO VS=1 L=1944 FT SLP=0.0133

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	14.648	16.18	.4887
.211	32.908	54.64	.3252
.316	54.781	114.41	.2586
.421	80.266	196.72	.2203
.526	109.362	303.22	.1948
.632	142.071	435.66	.1761
.737	178.392	595.81	.1617
.842	218.326	785.45	.1501
.947	261.871	1006.29	.1405
1.053	308.705	1280.55	.1302
1.158	356.882	1607.82	.1199
1.263	406.078	1966.59	.1115
1.368	456.294	2356.29	.1046
1.474	507.529	2776.48	.0987
1.579	559.784	3226.85	.0937
1.684	613.058	3707.15	.0893
1.789	667.351	4217.21	.0855
1.895	722.664	4756.92	.0820
2.000	778.996	5326.21	.0790

ROUTE ID=15 HYD NO=406.1 INFLOW ID=14 DT=0.0

PRINT HYD ID=15 CODE=1

HYDROGRAPH FROM AREA 406.10

RUNOFF VOLUME = 1.29860 INCHES = 7.4037 ACRE-FEET
PEAK DISCHARGE RATE = 122.02 CFS AT 1.633 HOURS BASIN AREA = .1069 SQ. MI.

*S **CALC BASIN 408
COMPUTE NM HYD ID=17 HYD NO=408.00 AREA=0.03563 SQ MI
PER A=0 PER B=29 PER C=29 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 59.081 CFS UNIT VOLUME = .9992 B = 526.28 P60 = 1.8700
AREA = .014965 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .118429HR TP = .133300HR K/TP RATIO = .888442 SHAPE CONSTANT, N = 3.992480
UNIT PEAK = 54.984 CFS UNIT VOLUME = 1.000 B = 354.67 P60 = 1.8700
AREA = .020665 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=17 CODE=1

HYDROGRAPH FROM AREA 408.00

RUNOFF VOLUME = 1.29860 INCHES = 2.4677 ACRE-FEET
PEAK DISCHARGE RATE = 74.10 CFS AT 1.500 HOURS BASIN AREA = .0356 SQ. MI.

*S ROUTE FLOW FROM BASINS 408 TO THE AMOLE DEL NORTE CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.0 MAX EL=102.0
CH SLOPE=0.0172 FP SLOPE=0.0162 N=0.032 DIST=437

DIST	EL	DIST	EL	DIST	EL	DIST	EL
0	102.0	123	101.0	164	100.0	268	101.0
437	102.0						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.11	.80	.67	15.26
100.21	3.21	4.23	30.53
100.32	7.23	12.48	45.79
100.42	12.85	26.88	61.05
100.53	20.08	48.74	76.32
100.63	28.92	79.26	91.58
100.74	39.36	119.56	106.84
100.84	51.41	170.69	122.10

100.95	65.07	233.68	137.37
101.05	80.54	300.72	160.37
101.16	99.03	377.62	191.10
101.26	120.77	475.87	221.84
101.37	145.74	596.97	252.58
101.47	173.94	742.62	283.31
101.58	205.38	914.55	314.05
101.68	240.06	1114.55	344.79
101.79	277.97	1344.34	375.52
101.89	319.11	1605.65	406.26
102.00	363.50	1900.17	437.00

COMPUTE TRAVEL TIME ID=1 REACH NO=1 NO VS=1 L=754 FT SLP=0.0162

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.803	.67	.2523
.211	3.213	4.23	.1590
.316	7.230	12.48	.1213
.421	12.853	26.88	.1001
.526	20.083	48.74	.0863
.632	28.919	79.26	.0764
.737	39.363	119.56	.0690
.842	51.412	170.69	.0631
.947	65.069	233.68	.0583
1.053	80.535	300.72	.0561
1.158	99.034	377.62	.0549
1.263	120.768	475.87	.0532
1.368	145.737	596.97	.0511
1.474	173.942	742.62	.0491
1.579	205.382	914.55	.0470
1.684	240.057	1114.55	.0451
1.789	277.968	1344.34	.0433
1.895	319.115	1605.65	.0416
2.000	363.497	1900.17	.0401

ROUTE ID=1 HYD NO=408.1 INFLOW ID=17 DT=0.0
PRINT HYD ID=1 CODE=1

HYDROGRAPH FROM AREA 408.10

RUNOFF VOLUME = 1.29860 INCHES = 2.4677 ACRE-FEET
PEAK DISCHARGE RATE = 62.47 CFS AT 1.567 HOURS BASIN AREA = .0356 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 13:23:44